INDIVIDUAL AND SOCIAL DYNAMICS OF SELF-CONTROL

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Given the importance of self-control for consumers' well-being and success in life, my dissertation aims to provide novel theoretical insights to the self-regulation literature and inform practical interventions that work to consumers' long-term benefit. Contrary to most extant research on the topic, my dissertation explores both individual and social dynamics of consumers' self-regulation. My dissertation progresses from an internal, individual perspective on self-control to a socially-embedded, cooperative perspective.

First, Essay 1 focuses on the internal state of the consumer, considering cognitive strategies used in self-control contexts. Specifically, I explore two dimensions of consumers' recall of previous self-regulation acts - valence and subjective difficulty of recall– and how their interplay influences current self-control. Progressing toward understanding the social dynamics of self-control, in Essay 2 I examine two specific strategies that consumers use to cope with social identity threats – where individuals either highlight positive dimensions of the self or emphasize favorable intergroup differences, and compare their impact on subsequent self-control. Finally, Essay 3 studies self-control through a purely social lens and compares the joint self-control decisions of three different dyad types - homogeneous high self-control, homogeneous low self-control, and mixed, to determine which lead to better self-control within the dyad and which prove detrimental to the achievement of shared long-term goals.

Taken together, the three essays of my dissertation make novel theoretical contributions not only to the self-control literature, but also to the literatures studying metacognition, self-perceptions, social identity, dyadic decision making, and marital well-being. Furthermore, the findings of my dissertation offer a series of practical implications and insights that can guide consumers, public policy makers, and managers to achieve a variety of objectives.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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1.0 INTRODUCTION

Behaving in accordance with long-term goals is not an easy endeavor. Consumers are constantly surrounded by alluring temptations that come in a variety of forms – a mouthwatering, but unhealthy meal, an expensive splurge in the clothing store, and maybe a sudden urge to yell to their spouse or boss. Consumers' failure to resist such temptations impedes the achievement of their long-term goals and often leads to poor life outcomes. In fact, such self-control lapses appear to be the cause for many of the most alarming societal problems, such as obesity, alcohol abuse, drug addiction, and excessive amounts of household debt.

Given the importance of self-control for consumers' well-being and success in life, my dissertation aims to provide novel theoretical insights to the self-regulation literature and inform practical interventions that work to consumers' long-term benefit. Contrary to most extant research on the topic, my dissertation explores both individual and social dynamics of consumers' self-regulation. My dissertation progresses from an internal, individual perspective on self-control to a socially-embedded, cooperative perspective.

First, Essay 1 focuses on the internal state of the consumer, considering cognitive strategies used in self-control contexts, such as the recollection of previous self-control behaviors. Specifically, I explore two dimensions of consumers' recall of self-regulation acts - valence and subjective difficulty of recall– and how their interplay influences current self-control. Progressing toward understanding the social dynamics of self-control, in Essay 2 I

examine two specific strategies that consumers use to cope with social identity threats and compare their impact on self-control. Finally, in Essay 3 I study self-control through a purely social lens and compare the joint self-control decisions of three different dyad types - homogeneous high self-control, homogeneous low self-control, and mixed, to determine which lead to better self-control within the dyad and which prove detrimental to the achievement of shared long-term goals.

Taken together, the three essays of my dissertation make novel theoretical contributions not only to the self-control literature, but also to the literatures studying metacognition, self-perceptions, social identity, dyadic decision making, and marital well-being. Furthermore, the findings of my dissertation offer a series of practical implications. In each essay I provide a roadmap that can guide consumers, public policy makers, and managers to achieve a variety of objectives. Specifically, the insights of my work can (1) aid consumers in improving their long-term well-being through embracing healthy eating habits, spending wisely, and achieving their long-term goals, (2) provide public policy makers with easily implementable interventions for overcoming various societal pathologies (obesity, household debt, alcohol addiction) and promoting greater savings for retirement, (3) help marketers increase sales of both healthy and indulgent foods, and (4) assist managers in the development of successful and productive teams at the workplace.

1.1 ABSTRACT OF ESSAY 1

I explore two dimensions of consumers' recall of past self-regulation acts - (1) valence of recalled acts (successes or failures) and (2) the metacognitive information provided by the

subjective ease of retrieval – and how their interplay influences self-control. Seven studies reveal that recalling failures promotes indulgence regardless of recall difficulty. However, when recalling successes, metacognitive information matters: easily-recalled successes prompt consumers to demonstrate increased self-control than when the recall of past successes is difficult. I document that these effects are driven by consumers' perceptions about their self-control ability, as formed on the basis of their recollections. Moderation results also provide support for this mechanism, demonstrating attenuation of effects in two situations: first, for consumers who do not tend to integrate their past behaviors into their self-perceptions and second, when consumers lack the certainty to use self-beliefs to guide their current behaviors. Taken together, this work enhances our understanding of self-control, self-perceptions, and metacognition.

1.2 ABSTRACT OF ESSAY 2

Past research demonstrates that coping with social identity threats undermines subsequent self-control. Yet there are many different strategies consumers use to cope with these threats: are all strategies equally costly to self-control? This work examines two specific coping strategies – where individuals either highlight positive dimensions of the self (*superior self aspects* strategy), or emphasize favorable intergroup differences (*inferior others* strategy) – and compares their influence on self-control. In one field study and seven experiments, using both naturally-occurring and manipulated threats, explicit and subtle strategy prompts, and measuring both real and hypothetical self-control behavior, I find that the intergroup differences strategy damages self-control more than the self-focused coping strategy. These differences in self-control occur

because the inferior others strategy requires individuals to shift their thoughts from accessible self-knowledge to inaccessible out-groups knowledge and this consumes self-regulatory resources. Consistent with this mechanism, two experiments demonstrate that increasing the accessibility of out-groups knowledge diminishes the detrimental impact of the inferior others strategy on self-control. These findings highlight the importance of understanding the potential differences and similarities among various coping strategies and contribute to both the social identity and self-control literatures.

1.3 ABSTRACT OF ESSAY 3

Opposites may attract, but do they succeed together? This research compares the joint self-control decisions of homogenous high self-control, homogeneous low self-control, and mixed self-control dyads. Seven studies conducted with virtual and lab-created dyads, as well as actual married couples in four self-control domains, robustly reveal that in joint decisions, homogeneous high self-control pairs make less indulgent choices than both homogeneous low self-control and mixed pairs. However, there is no difference in the self-regulatory patterns of the latter two dyad types: having one high self-control partner in a dyad does not lead to more restraint than having none. I argue that this pattern exists because higher self-control individuals tend to prioritize prorelationship behaviors over their personal preference for restraint. Therefore, they assent to the lower self-control partner's more indulgent preferences. Consistent with this explanation, results suggest that interventions that change individuals' pro-relationship motivation can alter this pattern. Given the range of decisions consumers may make in couples or pairs, this research has implications for consumers, marketers, and public-policy makers.

2.0 ESSAY 1: HAUNTS OR HELPS FROM THE PAST: THE INTERPLAY OF VALENCE AND EASE OF RECALL ON SELF-CONTROL

Thoughts about the past may clutter our minds when we make decisions in the present. Imagine standing in your favorite department store, trying to decide whether you should splurge on an expensive piece of clothing despite the fact that it is well beyond your budget. While walking around the store, you may think, "Hmm, I spent so much money on the getaway weekend with my friends last week; I went over my credit card limit last month …" Or instead of focusing on recalling a few of your past self-control failures, you might think about some of your past successes. For instance, you might recall instances in which you resisted splurging on unnecessary items and saved your money instead. How would your current decision be affected by the experience of recalling your past self-regulation successes or failures?

To answer this question, I explore two dimensions of consumers' recall of past self-regulation behaviors - (1) the valence of the recalled acts (past successes or failures) and (2) the metacognitive information provided by the subjective ease of retrieval – and how their interplay influences self-control. I show that recalling failures promotes indulgence regardless of recall difficulty. However, when recalling successes, metacognitive information matters: easily-recalled successes lead consumers to exhibit better self-control than when the recall of successes is difficult. Using a chain-of-experiments approach (Meyvis, Goldsmith, and Dhar 2012; Spencer, Zanna, and Fong 2005), I show that these effects occur because consumers use recall of

the past to form perceptions of their present self-control ability. They then act in accordance with their beliefs about themselves. Consistent with this mechanism, I demonstrate that these effects occur only for consumers who integrate their past behaviors into their self-perceptions. Furthermore, again in support of the self-perceptions mechanism, I also show that when consumers experience situationally-low self-certainty, they no longer use their self-perceptions to guide their current self-regulatory behaviors. As such, while I replicate the proposed effects under conditions of high self-certainty (i.e., conditions in which consumers are certain in their self-perceptions and rely on their beliefs to guide their current self-regulation), when consumers experience low self-certainty, the effect of recall on current self-regulation is attenuated.

The present work contributes new insights to the self-regulation literature, but also contributes to our understanding of the effects of metacognition and self-perception. First, I demonstrate that it is *not* only the valence of recall that matters, but also the metacognitive information that accompanies recall. As a result, the effect of easy recall may be completely different from the effect of difficult recall. My focus on the importance of the metacognitive experience of recall thus extends the work of Mukhopadhyay, Sengupta, and Ramanathan (2008), who examined how the valence of recall of past food-related temptations affects consumers' current indulgence differently depending on their chronic impulsivity. Second, I show that the ease-of-retrieval effects are not symmetric in the case of recalling past self-control behaviors; the ease-of-retrieval effects emerge when one recalls self-control successes but *not* when failures are recalled as the later type of recall adversely impacts individuals' mood, which inhibits reliance on the ease-of-retrieval heuristic. Thus, I contribute to the ease of retrieval literature by responding to Ruder and Bless' call for more research investigating the limiting conditions of the ease of retrieval effects (2003). Third, previous research demonstrates that after

an initial act of self-control, subsequent attempts at self-control are more likely to fail. Across numerous studies, such failure is shown to be greater among depleted as opposed to non-depleted individuals (Baumeister, Vohs, and Tice 2007; Muraven and Baumeister 2000; Vohs 2006). My research reveals that self-control failures can occur even in the absence of differential depletion simply due to different recall activity. As such, this research extends recent work showing that consumers' own mental operations can influence their present self-control even without actual depletion of self-regulatory resources (Job, Dweck, and Walton 2010). Finally, past work has focused on balancing and licensing as explanations for the effect of past behaviors on current behaviors (Dhar and Simonson 1999; Khan and Dhar 2006). I show that consumers' certainty in their self-view is an important factor that determines when recall produces self-consistency versus switching (e.g., licensing or balancing), such that either pattern of outcomes may be observed under conditions of high and low self-certainty respectively.

2.1 CONCEPTUAL FRAMEWORK

2.1.1 How does recall influence consumers' decisions?

Consumers often use their past behaviors to guide their present decisions (Albarracín and Wyer 2000; Bentler and Speckart 1981; Ouelette and Wood 1998; Taylor 1975), thus making the recollections of one's past an invaluable source of information which can be used to guide one's actions (Aarts and Dijksterhuis 1999). People seem to intuit this role of memory. For instance, from their early childhood, children are often encouraged to think about their past mistakes and learn from them. How successful will this strategy be in the domain of self-control?

Some insight into how this practice may influence consumers is provided by the work of Mukhopadhyay et al. (2008), who demonstrate that the recall of past food-related temptations, which were either successfully resisted or succumbed to (successes versus failures respectively), interacts with consumers' chronic impulsivity to influence their current self-control behaviors. Mukhopadhyay et al. (2008) find that impulsive consumers exhibit switching patterns, meaning that they succumb to current temptations if they recall having resisted a similar temptation in the past and vice versa; in contrast, non-impulsive individuals show behavioral consistency – they resist (succumb to) current temptations if they recall having resisted (succumbed) in the past.

I propose that the valence of recalled information may not fully explain the effect of recollection on self-control. Extant research suggests that the recall of one's past experiences provides individuals with two separate sources of information: the content of the recollections (i.e., valence) and the subjective experience of ease or difficulty with which those past experiences come to mind (Jacoby, Kelley, and Dywan 1989; Schwarz 1998, 2004). Current judgments, decisions, and actions are thus shaped not only by the valence of retrieved information, but also by the subjective experiences and feelings that accompany the retrieval process (Dijksterhuis, Macrae, and Haddock 1999, Schwarz 2004; Schwarz and Clore 1996; Schwarz and Vaughn 2002; Schwarz et al. 1991; Strack 1992).

Most relevant to my research, Schwarz et al. (1991) demonstrate that evaluations of the self are formed on the basis of not only the contents of one's recollections, but also the experience associated with the retrieval process itself, that is how subjectively easy or difficult it is to bring these contents to mind. For example, in their studies, Schwarz et al. (1991) showed that participants who had to recall 12 instances of assertive (unassertive) behavior and thus experienced greater retrieval difficulty perceived themselves as less assertive (less unassertive)

than participants who had to recall 6 such instances and found the retrieval easy. Retrieval difficulty qualified the recall content to such an extent that participants' judgments were opposite to the conclusions drawn from the content that was brought to mind (Schwarz et al. 1991). Given these findings, I suggest that the work of Mukhopadhyay et al. (2008) can be meaningfully extended by examining the interactive influence of both valence of recollections and the metacognitive experience accompanying recall on consumers' present self-control. I next present a framework that integrates these sources of information and suggests a mechanism by which they may interact to influence consumers' tendency to indulge in the present.

2.1.2 The interplay of valence of recalled acts and ease of recall on self-control

My conceptual framework begins with the proposal that recall of self-control acts will prompt consumers to form perceptions about their own self-control ability. I ground this prediction in analytical work by Battaglini, Bénabou, and Tirole (2005), who propose that people often attempt to infer their own ability to resist temptations from their past actions. Due to imperfect knowledge about one's self-control ability, individuals perceive their past choices as "indicative of 'what kind of person' they are" (Bem 1972; Bénabou and Tirole 2004; Prelec and Bodner 2003). Recent research also shows that consumers infer the strength of their willpower from the way in which they handle tempting opportunities (Dhar and Wertenbroch 2012). My prediction is also in line with self-efficacy theory, which argues that successes contribute to the building of a sound belief in one's efficacy, while failures tend to undermine it (Bandura 1994). Therefore, recalling self-control failures should lead to negative perceptions of self-control ability, whereas recalling successes will encourage positive perceptions of self-control ability. But how will the subjective ease or difficulty of consumers' recall alter these perceptions?

First, consider recalling one's past successes at self-regulation. Schwarz et al. (1991) reveal that experiences retrieved in a subjectively easy manner are considered to be more self-descriptive than those recalled with greater subjective difficulty. Based upon this ease-of-retrieval heuristic (Schwarz et al. 1991), I therefore propose that individuals who find it easy to recall their past self-control successes will perceive themselves as better at self-control than those whose recall of past successes is difficult. Thus, individuals will perceive themselves as good self-regulators when the recall of past successes is easy. But when recall is difficult, they may not believe themselves to be particularly good at self-regulation, as the metacognitive information provided by the retrieval difficulty tempers their self-view.

But what about cases in which consumers recall their failures? If failures were treated like successes, difficulty during recall should provide a metacognitive cue that the recalled failures are *not* characteristic of a consumer's overall self-control ability. As such, consumers having difficulty recalling past failures at self-regulation should, based on the ease-of-retrieval heuristic, infer that they are better at self-control than those whose recall of failures is easy.

However, note that the ease-of-retrieval heuristic may not be activated in the case of recalled failures. First, I suggest that recalling past self-control failures will adversely impact consumers' mood. Since self-control failures are seen as normatively negative both for the self and the society (unlike the outcomes of interest studied within ease-of-retrieval research, e.g., assertiveness in Schwarz et al. 1991) (Baumeister, Heatherton, and Tice 1994; Tangney, Baumeister, and Boone 2004), I anticipate that individuals whose recollection is focused on their past failures will be in a more negative mood state than those who recollect their successes. Furthermore, I suggest that the more negative mood associated with recall of failures will inhibit reliance on the ease-of-retrieval heuristic relative to the more positive mood generated by recall

of successes. Past research highlights that more negative affective states reduce reliance on heuristic information processing and increase the use of analytic processing (Schwarz 1990) and the information at hand (Bless and Schwarz 1999; Schwarz 1990). In addition, prior research has explicitly demonstrated that as affective states become more negative, individuals rely on the activated content rather than the experienced ease or difficulty in their judgments (Ruder and Bless 2003; Greifeneder and Bless 2008).[1]

Thus, I anticipate that consumers will *not* use the difficulty-of-retrieval heuristic when they recall self-control failures because of the adverse effect that such recall has on their mood. Rather, when recalling failures, individuals will base their self-control perceptions *only* on the content of their recollections. As a result, any recall of failures, whether relatively easier or more difficult, will lead consumers to believe that they have less self-control. Taken together:

H1: The two recall dimensions - valence of recalled acts and ease of recall – will interact to influence consumers' beliefs about their own self-control. Specifically:

a) When consumers recall self-control successes, they will perceive themselves as worse at self-control when the retrieval is difficult than when it is easy, and,

b) When consumers recall self-control failures, they will tend to perceive themselves as equally poor at self-control no matter whether the retrieval is difficult or easy.

[1] I note that past research has already shown the ease-of-retrieval effects occur even in cases when one thinks about negative information (e.g., unassertiveness in Schwarz et al. 1999; undesirable risks in Song and Schwarz 2009; unsafe situations in Caruso 2008). However, note that the self-control failures studied in our work are seen as normatively negative both for the self and the society. As a result, since those failures have negative implications for the self, their recall makes mood less positive and reduces reliance on the ease-of-retrieval heuristic. By contrast, the outcomes of interest often studied within ease-of-retrieval research (e.g., unassertiveness in Schwarz et al. 1991; reasons against choosing a BMW in Wänke, Bohner, and Jurkowitsch 1997; undesirable risks in amusement parks in Song and Schwarz 2009) could be seen as more normatively ambiguous. The recall of normatively ambiguous information would not necessarily affect mood (I don't feel that bad if I failed to be assertive in a given situation, generated reasons against choosing a BMW, or evaluated undesirable risks in amusement parks), and therefore, the ease-of-retrieval heuristic is used in these cases.

I further propose that consumers' self-perceptions resulting from the recall will change their behaviors with regard to a present self-control related decision. People have a vested interest in seeing that their self-perceptions do not change (Swann, Jr. and Ely 1984). Therefore, people tend to behave in a manner consistent with these self-perceptions. Furthermore, inconsistency with one's beliefs about themselves is often viewed as "a painful or at least psychologically uncomfortable state" (Zajonc 1960, p. 282), which individuals are typically motivated to avoid. In fact, the desire to be self-consistent is so powerful that consumers tend to act consistently with their self-views even when those self-views are negative (Kwang and Swann, Jr. 2010). In addition to escaping the negative consequences of inconsistency, individuals are also likely to act in keeping with their own self-perceptions simply because consistency offers a convenient heuristic for decision-making (Cialdini 1993). In sum, I anticipate that consumers will behave consistently with their perceptions about their self-control ability, such that they will indulge (restrain) when they perceive themselves as being low (high) in self-control. Formally:

H2: Consumers will act consistently with their own perceptions about their self-control ability, such that they will restrain (indulge) when they perceive themselves as good (bad) at self-regulation. This will lead to the following effects of the two recall dimensions – valence and ease of recall – on present self-control:

a) When consumers recall self-control successes, they will indulge more when the retrieval is difficult than when it is easy, and,

b) When consumers recall self-control failures, they will indulge no matter how difficult or easy the retrieval of the self-control acts is.

I test these predictions in seven studies. The first two studies provide support for hypotheses 1 and 2, showing that the interplay of valence and ease of recall shapes consumers' perceptions about their self-control ability (study 1A), which, in turn, influences their current

self-regulatory behaviors in a perceptions-consistent manner (study 1B). In studies 2A, 2B and 2C, I demonstrate the interaction of valence and ease of recall on current self-control (hypothesis 2). I do this using real self-control behaviors in two different task persistence contexts (i.e., persisting on a challenging task in study 2A and allocating time between a funny video and an educational video about financial planning in study 2C), a more ecologically valid setting in which advertising stimuli cue the recall of successes or failures (study 2B), as well as both manipulating (studies 2A and 2C) and measuring recall difficulty (study 2B). Importantly, study 2C's design also allows me to show that the ease-of-retrieval heuristic is not used in cases of failure recall because of the effect of such recall on mood. Finally, the last two studies demonstrate moderation consistent with the proposed self-perceptions mechanism, such that effects are attenuated either for consumers who do not integrate their past behaviors into their self-perceptions or in situations of low self-certainty when consumers doubt their self-beliefs and are less likely to use them to guide current behavior.

2.2 STUDY 1

I first designed two studies to test hypotheses 1 and 2. Recall that I proposed that recalling self-control behaviors will prompt consumers to form perceptions about their overall self-control ability, which in turn will change their current self-control behaviors. To demonstrate this proposed process, I used a "chain of experiments" approach, recommended by Spencer, Zanna, and Fong (2005) to show psychological process, as used recently by Meyvis, Goldsmith, and Dhar (2012). I note that this design is more appropriate for the present research than the

traditionally used measurement-of-mediation design because the measurement of the mediator after the outcome variable would likely be contaminated by participants' behavior in the self-control task (i.e., participants' responses to the questions designed to measure the perceptions of their self-control ability will not be a pure reflection of their recall but rather will be biased by their more recent response to the self-control dependent variable). Thus, in the "chain of experiments", study 1A will demonstrate the effect of the independent variables on the mediator (i.e., the interaction of valence and ease of recall on consumers' self-perceptions), and, study 1B will show the influence of the mediator on the outcome variable (self-perceptions on current self-control).

2.3 STUDY 1A

2.3.1 Method

Study 1A followed a 2 (valence of recalled acts: successes vs. failures) x 2 (ease of recall: easy vs. difficult recall) between-subjects design. Participants (n = 133; 50% female) were undergraduate students who completed the study in exchange for course credit. The participants were told that they were taking part in an experiment examining the writing styles of college students and, therefore, they would be asked to write about past events. Participants randomly assigned to the successes condition were asked to recall and describe as fully as possible instances in which they were faced with a spending temptation (e.g., being tempted to splurge on an expensive, but unnecessary item that they really liked; being tempted to spend beyond their budget) and they were *able to successfully control their spending behavior*. Respondents in the

failures condition recalled instances in which they were faced with a spending temptation and they were *not able to control their spending behavior*. Following Pham, Lee, and Stephen (2012), I manipulated recall difficulty by having respondents recall either 2 or 10 instances.

Following the writing task, all participants answered questions regarding their perceptions about their self-control ability. Specifically, respondents indicated their agreement with the following three statements using a 7-point scale, anchored by 1 = "Strongly Disagree" and 7 = "Strongly Agree": "I am good at controlling my own behavior.", "I am generally a success at self-regulation.", and "I have a long history of self-control failures." Participants' responses to these three statements (α = .82) were averaged to create a self-control perceptions index. Furthermore, the difficulty of the recall task was measured by participants' responses to two questions ("How difficult did you find the task of retrieving the similar past self-control instances?", anchored by 1 = "Not Difficult At All" and 7 = "Very Difficult", and "How easy was it to recall the similar past instance you were asked to list and describe in details?", anchored by 1 = "Not Easy At All" and 7 = "Very Easy" (reverse-coded)), which were averaged (α = .93) to form a recall difficulty index used as a manipulation check. Participants' demographic information was also collected at the end of the experiment.

2.3.2 Analysis and results

In all studies partial data were provided by some respondents on some variables; where data are available, they are included in the analysis.

2.3.2.1 Manipulation check

I conducted a two-way ANOVA on the recall difficulty index as a function of the valence condition, ease of recall condition, and their interaction. As anticipated, only the main effect of the ease of recall condition was significant, $F(1, 129) = 48.37$, $p < .0001$, such that participants who recalled 10 acts ($M = 5.54$, $SD = 1.49$) perceived the recall task to be significantly more difficult than those who recalled only 2 acts ($M = 3.55$, $SD = 1.82$).

2.3.2.2 Perceptions about one's self-control

A two-way ANOVA was performed in which the self-control perceptions index was predicted by the valence condition, the ease of recall condition, and their interaction. Results revealed a significant main effect of the ease of recall condition on self-control perceptions, $F(1,129) = 4.12$, $p = .04$, which was qualified by a significant interaction of the valence of recall and ease of recall, $F(1,129) = 4.12$, $p = .04$ (see figure 1). Planned contrasts revealed that participants whose recall of self-control successes was easy ($M = 5.56$, $SD = 1.00$) perceived themselves to be better at self-regulation than those whose recall of successes was difficult ($M = 4.79$, $SD = 1.04$), $F(1,129) = 8.29$, $p < .01$. In contrast, participants in the failures condition possessed perceptions of being low in self-control no matter whether their recall was easy ($M = 4.91$, $SD = 1.15$) or difficult ($M = 4.91$, $SD = 1.19$), $p = .99$.

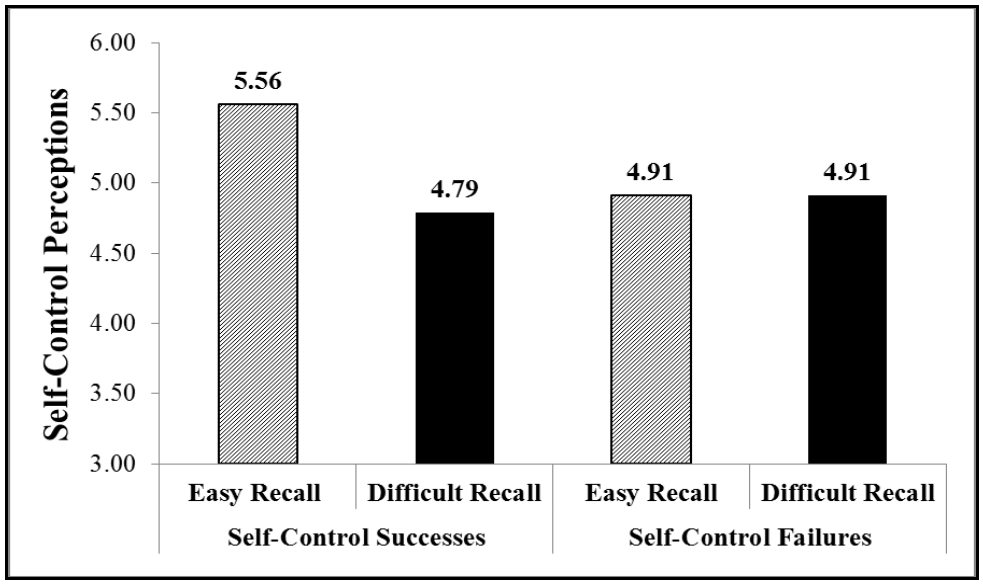

Figure 1. Interaction of Recalled Act Valence and Retrieval Difficulty on Perceptions about Self-Control

2.3.3 Discussion

Study 1A provides support for hypothesis 1 by demonstrating the significant impact of the interaction of valence and ease of recall on consumers' perceptions of their self-control (i.e., the IV → mediator part of the proposed conceptual chain). Specifically, results revealed that when participants recalled self-control failures, they did not use the ease-of-retrieval heuristic; rather, they based their self-control perceptions *only* on the content of their recollections. Thus, any recall of failures, whether easier or more difficult, led them to believe that they had less self-control. In contrast, when recalling successes at self-regulation, the ease of retrieval and valence of recalled acts jointly determined participants' perceptions of their self-control ability, such that individuals whose recall of successes was easy perceived themselves to be better at self-control than those whose recall was more difficult.

Study 1B proceeds with testing whether this change in individuals' self-perceptions induced by the interaction of the two recall dimensions indeed influences current self-control (Hypothesis 2; i.e., the mediator → DV part of the chain of experiments).

2.4 STUDY 1B

2.4.1 Method

Study 1B used a 2 (valence of self-control perceptions: negative vs. positive) between-subjects design. Participants (n = 88; 56% female) were told that they would be asked to complete several unrelated tasks provided by different researchers. The first task was an essay writing task which contained the manipulation of self-control perceptions (adapted from Polivy and Herman 1991). In this task I randomly assigned them to write about one of two topics: "How *poor* has your self-control been in the last 24 hours?" (negative self-control perceptions condition) and "How *good* has your self-control been in the last 24 hours?" (positive self-control perceptions condition). To strengthen the manipulation I also gave participants the following additional directions: *"…This might include telling us about times that you ate some unhealthy, but indulgent foods, bought something on impulse, or could not control your emotions in your interactions with others."* (negative self-control perceptions condition) and *"…This might include telling us about times that you resisted eating some unhealthy, but indulgent foods, refrained yourself from buying something on impulse, or successfully controlled your emotions in your interactions with others."* (positive self-control perceptions condition). Following the essay writing task, participants were presented with an imagination task, in which they were

asked to imagine as vividly as possible a scenario that contained a self-control dilemma, adapted from Dholakia, Gopinath, and Bagozzi (2005):

> "Imagine that you have gone to the mall and your total budget for the whole shopping trip is $40 in cash. As you are walking through the mall, your eyes fall upon a great-looking shirt. The shirt is of a style that you have wanted to buy for a long time, and is in your favorite color. You try the shirt on and you are surprised how perfectly it suits. Moreover, the salesperson tells you that they have just one piece left in your size, and it is unlikely that they will get more pieces in this style in the future. Unfortunately, the price of the shirt is beyond your cash budget. If you decide to purchase it, you would have to put the remaining balance on your credit card. You are sitting in the store trying to decide whether you should stick to your budget and forgo buying the shirt or pamper yourself with it by putting the amount of money above your budget on your credit card."

At the end of the scenario, participants were told that the shirt could cost between $60 and $160 (or from $20 to $120 above their cash budget) and were asked to indicate how much money they were willing to charge on their credit cards in order to purchase the shirt. The amount of money which participants were willing to put on their credit cards (hereafter referred to as the debt amount) was measured on a slider scale ranging from $0 to $120 and constituted the outcome variable in this study. Participants' demographic information was collected at the end of the study as well.

2.4.2 Analysis and results

2.4.2.1 Pretest

I first conducted a pretest to establish the effectiveness of the self-control perceptions valence manipulation. A separate group of participants (n = 49; 49% female) from the same population were randomly assigned to write an essay about how *poor* their self-control had been in the last 24 hours (negative self-control perceptions manipulation) or how *good* their self-control have been in the last 24 hours (positive self-control perceptions manipulation). Immediately after this manipulation, participants indicated

their agreement with the same three self-control perceptions items as in Study 1A which were averaged (α = .87) to create a self-control perceptions index to serve as a manipulation check. Using the same three-item self-control perceptions measure (as a measure of the mediator in study 1A and as a manipulation check of the manipulated mediator in study 1B) ensured that the psychological process as it was measured in study 1A and as it was manipulated in study 1B were in fact the same variable (Spencer et al. 2005). Results confirmed the manipulation effectiveness and showed that participants in the negative self-control perceptions condition (M = 3.37, SD = 1.70) perceived themselves to be worse at self-regulation than participants in the positive self-control perceptions condition (M = 5.19, SD = 1.47), $F(1,47) = 16.11$, $p < .001$.

2.4.2.2 Debt amount

I performed a one-way ANOVA using participants' debt amount as the dependent variable and the self-control perceptions condition as the between-subjects factor. Results revealed that participants in the negative self-control perceptions condition (M = \$19.52, SD = 20.47) were willing to incur more credit card debt than those in the positive self-control perceptions condition (M = \$10.44, SD = 15.03), $F(1, 86) = 5.15$, $p = .03$, thus demonstrating that people act consistently with their self-perceptions and supporting hypothesis 2.

2.4.3 Discussion

Studies 1A and 1B provide support for the mechanism underlying the effect of the joint influence of valence and ease of recall on current indulgence. I demonstrate that the content and ease of recall together lead consumers to change their perceptions about their overall self-control ability

(study 1A) and that self-control behaviors in the present are then consistent with beliefs about one's self-control tendencies (study 1B). Specifically, I show that when participants focused on their past self-regulation successes, they perceived themselves as better at self-control when the retrieval of the past behaviors was easy rather than difficult. In contrast, when individuals focused on their unsuccessful attempts at self-control, this led them to believe that they were low in self-control no matter whether their recall was associated with ease or difficulty. Subsequently, individuals who had positive perceptions about their self-control tended to restrain themselves better than those who had negative beliefs about their own self-control tendencies. These results suggest that recalling failures may not help consumers learn from the past but rather, may lead them to repeat their mistakes. Further, recalling successes as opposed to failures will only help consumers' self-regulation in the present when such recall is easy, since easy recall of success allows the maintenance of positive self-perceptions.

2.5 STUDY 2

Studies 2A, 2B, and 2C test the interactive effect of valence of recalled acts (successes vs. failures) and ease of recall on consumers' current self-control. Further, these three studies seek to demonstrate the robustness of these effects across different self-control contexts and decisions. Finally, in study 2C, I also test a major proposition of my theory: that recalling failures adversely affects individuals' mood. This negative mood, in turn, precludes the use of the retrieval heuristic when forming one's self-perceptions (Ruder and Bless 2003).

2.6 STUDY 2A

2.6.1 Method

Study 2A followed a 2 (valence of recalled acts: successes vs. failures) x 2 (easy vs. difficult recall) between-subjects design. English-speaking participants (n = 173, 56% female) were recruited through an online panel and completed the study in exchange for a small payment. Participants were told that they would perform several unrelated tasks for different researchers. The recall manipulation was presented as a part of the first task, which was supposedly designed to examine people's memory for various events. Unbeknownst to respondents, they were all randomly assigned to one of two kinds of events to recall: participants were asked to recall and describe as fully as possible past instances when they had to persist on a challenging task and they were either *"able to persevere until the end and completed the difficult task successfully"* (past self-control successes) or *"were not able to persevere until the end and gave up too soon"* (past self-control failures). I manipulated the difficulty of recall by asking respondents to recall either 2 or 10 such instances, following Pham et al. (2012).

After the writing task participants proceeded to the second presumably unrelated task, in which they worked on solving a set of four solvable and one unsolvable anagram. Following prior research (Muraven, Tice, and Baumeister 1998), I used participants' persistence at attempting to solve the unsolvable anagram as a measure of their self-control (in seconds). At the end of the study, respondents provided their demographic information.

2.6.2 Analysis and results

I excluded six outliers from the analysis as their values on the dependent variable were more than 2.5 standard deviations above the mean (following Tavassoli and Fitzsimons 2006). Including those observations does not change the results.

Time spent working on the unsolvable anagram was significantly skewed (skewness = 2.57; Shapiro Wilk's W = .78, $p < .0001$). I therefore conducted a two-way ANOVA on the log-transformed persistence time as a function of the valence of recalled acts condition, the difficulty of recall condition, and their interaction. I note that the results reported next hold even when we use the non-transformed dependent variable. Results revealed only a significant interaction of the two between-subjects factors, $F(1, 163) = 4.35$, $p = .04$, shown in figure 2. Planned contrasts showed that participants for whom the recall of self-control successes was easy (raw $M = 95.57$ sec, $SD = 99.36$; log-transformed $M = 4.08$, $SD = 1.11$) persisted significantly longer than those for whom the recall of successes was difficult ($M = 49.12$ sec, $SD = 43.45$; log-transformed $M = 3.47$, $SD = 1.02$), $F(1, 163) = 7.55$, $p < .01$. However, in line with my predictions, the simple main effect of recall difficulty was not significant in the failures condition (raw $M_{easy\ failures} = 70.43$ sec, $SD = 51.87$, log-transformed $M_{easy\ failures} = 3.95$, $SD = .86$; raw $M_{difficult\ failures} = 66.27$ sec, $SD = 36.16$, log-transformed $M_{difficult\ failures} = 3.99$, $SD = .75$), $p = .83$.

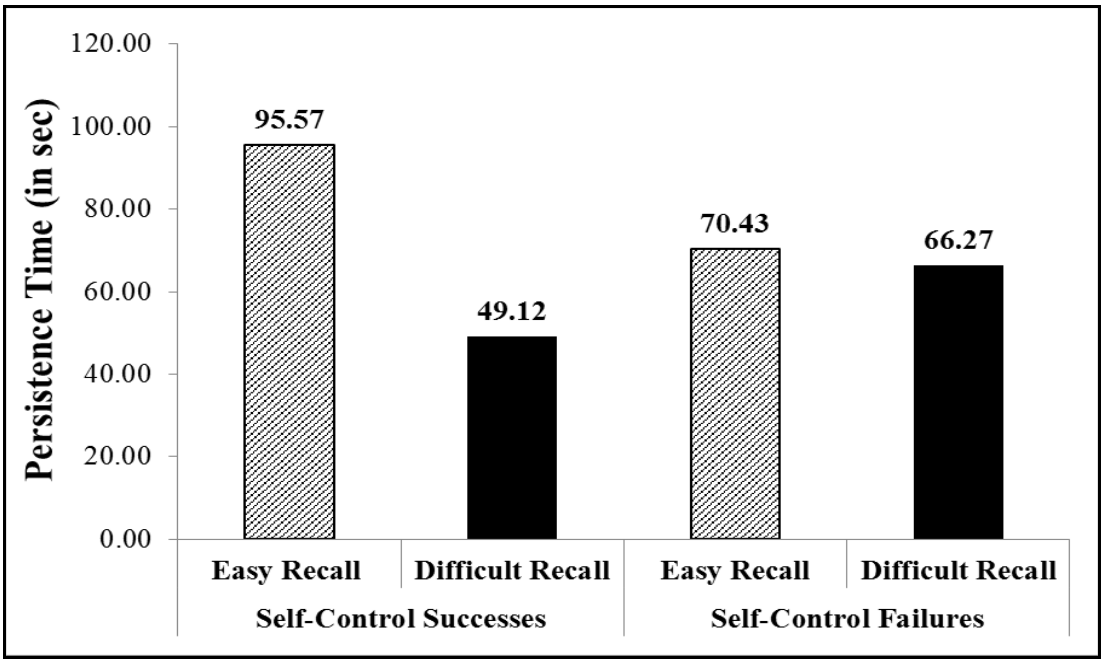

Figure 2. Interaction of Recalled Act Valence and Retrieval Difficulty on Time Persisting at an Unsolvable Anagram

2.6.3 Discussion

Using real self-control behavior, study 2A provided support for hypothesis 2. Results revealed that participants who recalled two past self-control successes (easy recall) exhibited better self-control and persisted significantly longer on a challenging task than those who retrieved ten such instances (difficult recall). However, when recalling failures at self-regulation, the difficulty of recall did not alter participants' current self-control; individuals who retrieved past unsuccessful attempts at self-control tended to give up earlier on the anagram-solving task no matter whether their recall was easy or difficult. The next study tests the robustness of these effects in a more ecologically valid situation. First, study 2B examines whether a more subtle cue to recall past behaviors, such as that which may be used in an advertising context, would lead to the same effects. Further, I test whether the same effects will emerge based upon idiosyncratic (measured), rather than manipulated, differences in recall difficulty.

2.7 STUDY 2B

2.7.1 Method

Study 2B followed a 2 cell (valence of recalled acts: successes vs. failures) between-subjects design with the difficulty of the past self-control acts retrieval as a second continuously measured factor. English-speaking participants (n = 151; 58% female; $37,562 mean income) were recruited through an online panel and completed the study in exchange for a small payment. Respondents were presented with an advertisement about the products of a fictitious bank designed to cue recall of past self-control failures or successes in the spending domain, as established in the pretest (see Appendix A).

After viewing these ads, participants were presented with a scenario asking them to imagine that they had just started a new job and were allowed to contribute to their new company's 401(k) plan. Investing in a 401(k) plan represents a commitment to long-term financial well-being and thus is an appropriate measure of self-control (Nenkov, Inman, and Hulland 2008). Thus, the outcome of interest was participants' likelihood to contribute to the 401(k) plan, which was measured on 7-point scale, anchored by 1 = "Very Unlikely" and 7 = "Very Likely." Participants also answered two questions regarding the difficulty of their recall (When you viewed the ad about WDS Bank, how difficult did you find the retrieval of your past self-control acts in the spending domain?", anchored by 1 = "Not Difficult At All" and 7 = "Very Difficult", and "When you viewed the ad about WDS Bank, how easy was it to recall your past self-control behaviors in the spending domain?", anchored by 1 = "Not Easy At All" and 7 = "Very Easy" (reverse-coded)), which were averaged (α = .73) to create a retrieval difficulty index. Finally, I asked participants one more question which served as an additional

manipulation check ("When you viewed the advertisement about WDS Bank and its savings products, did you recall your past self-control acts in the spending domain?", where 1 = "Definitely Yes" and 7 = "Definitely No") and collected demographic information.

2.7.2 Analysis and results

For all analyses, recall condition was contrast coded (-1 = recall of past failures; 1 = recall of past successes) and recall difficulty was mean-centered (M = 2.79, SD = 1.67). I also controlled for several demographic variables given the nature of our dependent measure (age, gender, education, employment, and socioeconomic status). None of the covariates had a significant impact on the outcome variable or interacted with our independent measures.

2.7.2.1 Manipulation and confound checks

I estimated an ANOVA using the valence of recalled acts condition to predict the extent to which participants recalled their prior self-control behaviors when viewing the two ads. Participants in the two ad conditions did not differ significantly in the extent to which they recalled their past self-control acts (p = .83).

2.7.2.2 Likelihood to contribute to a 401(k) plan

I estimated a regression model in which difficulty, valence of recall/ad condition, and their interaction predicted participants' likelihood to contribute to the 401(k) plan. Results revealed a significant negative main effect of recall difficulty, b = -.22, t(133) = -3.00, p = .003, which was qualified by a significant interaction of recall valence and difficulty, b = -.15, t(133) =

-2.10, p = .04. Following Aiken and West (1991), I plotted the values of the resulting regression equation at +1 SD and -1 SD from the mean subjective difficulty value, as shown in figure 3.

For participants who viewed the advertisement cueing recall of self-control successes, greater retrieval difficulty was associated with a significantly lower likelihood of contributing to the 401(k) plan, b = -.37, t(133) = -3.73, p = .0003. In contrast, for those participants presented with the advertisement cueing recall of self-control failures, difficulty of retrieval did not change the likelihood of contributing to the 401(k) plan, b = -.07, t(133) = -.69, p = .49.

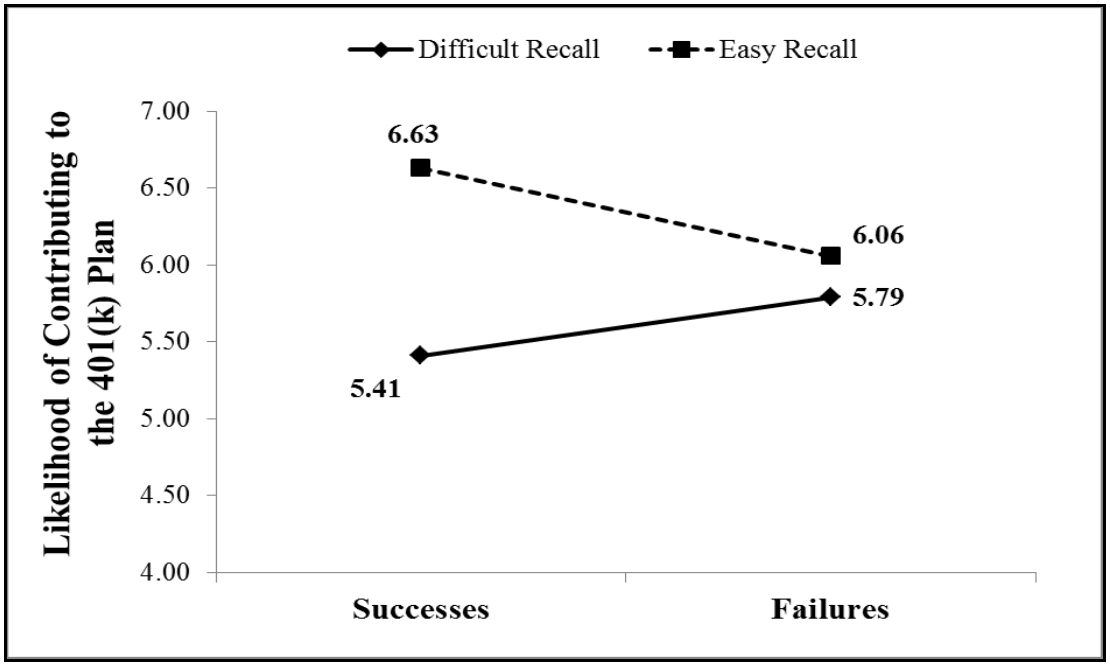

Figure 3. Interaction of Recalled Act Valence and Retrieval Difficulty on Likelihood to Contribute to 401(K) Plan
Note: The graph depicts the values of the dependent variable at the mean values of all covariates.

2.7.3 Discussion

Results again support hypothesis 2. Specifically, study 2B shows that when recalling failures, metacognitive experiences of difficulty or ease did not alter current self-control. However, participants recalling successes integrated the metacognitive information into their present

behavior. As a result, recalling successes did not enhance present self-control when recall was difficult, but encouraged participants to exhibit commitment to their long-term financial well-being when recall was easy. Importantly, study 2B suggests that external recall cues can create a similar pattern of effects as those that are more explicit, making our findings a potential source of intervention development. I return to this possibility in the general discussion.

The next study seeks to replicate the findings of studies 2A and 2B using a real self-control behavior in a different task persistence context. Importantly, in study 2C I seek to provide support for a basic assumption of our theoretical framework: the recollection of past self-control failures adversely impacts consumers' mood (relative to those recalling successes). Further, study 2C also introduces a unique method for assessing one's self-control.

2.8 STUDY 2C

2.8.1 Method

Study 2C followed a 2 (valence of recalled acts: successes vs. failures) x 2 (easy vs. difficult recall) x 2 (mood measurement: mood-only group vs. full-design group) between-subjects design. Participants (n = 219; 61% female; M_{income} = \$34,499) were recruited through Amazon's Mechanical Turk and completed the study online in exchange for a small payment.

Participants were told that the study consisted of several unrelated tasks. As in study 2A, the recall manipulation was presented as a part of the first task, which was supposedly designed to examine people's memory for personal events. Respondents were randomly assigned to one of two kinds of events to recall: participants were asked to recall and describe past instances "when

you managed your time poorly, and didn't get things done you needed to do" (failures condition) or "when you managed your time well and, even though you might have preferred to have had fun, you got everything done you needed to" (successes condition). As in prior studies, difficulty of recall was manipulated by asking respondents to recall either 2 or 10 such instances.

At this point, individuals in the mood-only group responded to the PANAS scale (Watson, Clark, and Tellegen 1988), which contained 10 positive (α = .92) and 10 negative items (α = .89), provided their demographic information, and the study was terminated. This group allowed me to test whether recall itself alters moods in ways consistent with my theory.

Full design participants continued to a purportedly unrelated task. Here, they were given two videos to watch – an educational video about financial planning and a funny video which contained selected moments from the TV show *Friends*. The duration of both videos was about 5-6 minutes. Participants were presented with the two videos side by side on the same screen and given a total of 5 minutes to watch the videos in any order and for any amount of time they choose. They were told that they could switch between the videos at any time and that they would be automatically advanced to the next screen when the 5-minute timer expires. Thus, participants were presented with the real self-control dilemma of doing something pleasurable in the short run that has no long-term benefits (watching the funny video) versus doing something less pleasant and more tedious in the short run that would help them better manage their finances in the long run (watching the educational video). I used the proportion of time spent watching the funny video as a measure of participants' self-control (time spent watching the funny video in seconds divided/total time of 300s). This new procedure represents a more sensitive measure than prior research in which self-control is assessed through the choice between more highbrow or lowbrow options (e.g., Read, Loewenstein, and Kalyanaraman 1999; Wang et al. 2010),

After the videos watching task, to test for mood-related effects, full-design participants responded to the same PANAS scale used by the mood-only participants. Finally, respondents provided their demographic information.

2.8.2 Analysis and results

2.8.2.1 Pretest

To ensure that the videos watching task presented participants with a self-control dilemma, I conducted a separate pretest in which we randomly assigned participants (n = 62) to watch either the funny or the educational video. Participants were asked to rate the videos as highbrow or lowbrow, and as a relative vice or a relative virtue using 9-point scales anchored by 1 = "Lowbrow"/"More of a vice" and 9 = "Highbrow"/"More of a virtue" respectively (as in Khan and Dhar 2007). Respondents also rated the quality of the video, its length and comprehensibility, their likelihood to recommend the video to others, attention paid to the video, and interest in watching the video. Results revealed that the educational video was perceived as more of a virtue (M_{ed} = 7.88, SD = 1.63; M_{funny} = 3.48, SD = 1.88; $F(1, 60) = 96.87$, $p < .0001$), and more of a highbrow video than the funny video (M_{ed} = 7.61, SD = 1.98; M_{funny} = 2.48, SD = 2.26; $F(1, 60) = 96.87$, $p < .0001$). The two videos did not differ in quality, length, comprehensibility, likelihood to recommend the video to others, attention paid to the video, and interest in watching the video (all p's > .24).

2.8.2.2 Mood results

For participants in the mood-only group (who responded to the mood measures immediately after the recall task), I estimated two separate ANOVAs using the valence of recalled acts, the difficulty of recall, and their interaction to predict participants positive and negative mood. Results revealed only a significant main effect of the valence of recalled acts condition on both the positive mood index ($F(1, 103) = 3.91$, $p = .05$) and the negative mood index ($F(1, 103) = 5.00$, $p = .03$). The main effect of recall difficulty (both p's $> .07$) and the interaction of the two factors (both p's $> .66$) were not significant. In line with my theory, participants who recalled their self-control failures had less positive and more negative mood ($M_{pos} = 2.51$, $SD = .83$; $M_{neg} = 1.54$, $SD = .69$) than those who recalled their successes ($M_{pos} = 2.82$, $SD = .93$; $M_{neg} = 1.29$, $SD = .42$). These results support my theory that recalling self-control failures adversely affects mood. This should mean that participants who continued onto the self-control task should only integrate the difficulty of recall into their self-perceptions if they recalled successes (but not failures) as the negative affect generated by the recall of failure reduces reliance on the ease-of-retrieval heuristic. Therefore, for individuals who recalled successes, participants should behave in ways consistent with successful past self-control only if their recall was easy as opposed to difficult. For individuals who recalled failures, only the content (valence) of recall should be integrated into their self-perceptions, and thus should lead to low self-control in the present irrespective of retrieval difficulty.

The same analysis was conducted also for the full-design group participants. Here neither the main effects nor the interaction was significant on both the positive and negative mood indices (all p's $> .15$).

2.8.2.3 Proportion of time spent watching the funny video

For the full design group, I estimated an ANOVA using the valence of recalled acts condition, the difficulty of recall, and their interaction to predict the proportion of time participants spent watching the funny video. None of the main effects were significant (both *p's* > .40); however, a significant interaction of the valence of recalled acts and the difficulty of recall emerged, $F(1, 108) = 4.91$, $p = .03$ (see figure 4). Planned contrasts revealed that, supporting hypothesis 2, participants for whom the recall of past self-control successes was easy watched the funny video for a significantly shorter amount of time than those for whom the recall of successes was difficult (proportion: $M_{easy\ successes} = .23$, $SD = .28$; seconds: $M_{easy\ successes}$ = 69.03 sec, $SD = 82.68$; proportion: $M_{difficult\ successes} = .44$, $SD = .37$; seconds: $M_{difficult\ successes}$ = 133.44 sec, $SD = 111.22$; $F(1, 108) = 4.25$, $p = .04$). However, as predicted, the simple main effect of recall difficulty was not significant in the failures condition (proportion: $M_{easy\ failures}$ = .37, $SD = .38$; seconds: $M_{easy\ failures}$ = 110.11 sec, $SD = 112.75$; proportion: $M_{difficult\ failures} = .27$, $SD = .34$; seconds: $M_{difficult\ failures}$ = 81.40 sec, SD = 100.76 $p = .31$). These effects hold also when using the raw amount of time spent watching the funny video as a dependent variable.

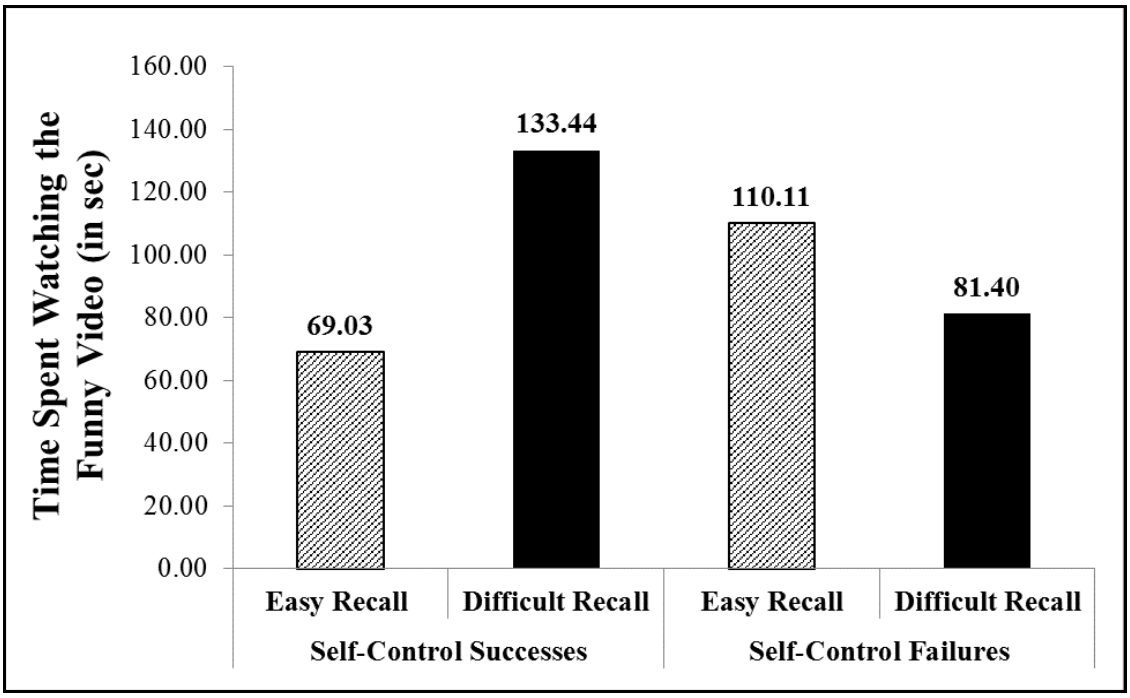

Figure 4. Interaction of Recalled Act Valence and Retrieval Difficulty on Time Spent Watching the Funny Video (in Seconds)

2.8.3 Discussion

In line with my theory, results for the mood-only group suggest that the recall of self-control failures has a negative impact on individuals' mood in comparison to recalled successes, which, according to past research (Ruder and Bless 2003), reduces the use of the ease-of-retrieval heuristic in the formation of the beliefs about one's self-control ability resulting from the recollection of previous behaviors. Then, consistent with these findings, the results for the full-design group revealed that the difficulty of recall affected current indulgence only in the case of recalled successes but not in the case of recalled failures. More specifically, individuals whose recall of past self-control successes was easy showed more restraint by limiting the amount of time that they watched the funny video than those whose recall of successes was difficult presumably in an effort to maintain their positive self-perceptions. However, when consumers

recalled failures at self-regulation, they tended to indulge by watching the funny video no matter how difficult the recall of those past acts was.

Thus far, results have provided robust evidence for hypotheses 1 and 2, suggesting that recall alters self-perceptions, which in turn shape behavior in a perceptions-consistent manner. The last two studies aim to provide additional support for the proposed self-perceptions mechanism underlying the effects of the valence and difficulty of recall on current self-control.

2.9 STUDY 3

My theory proposes that consumers' recollection of their previous self-control acts (the interaction of valence and difficulty of recall) alters consumers' beliefs about their self-control ability, which in turn influences their current self-control. However, one could argue that in certain situations or domains, some people might not necessarily integrate their past self-control behaviors into their self-perceptions. Therefore, we should see the hypothesized effects of valence and difficulty of recall on current self-control only in situations, domains, or for groups of people who habitually base their self-perceptions on their recalled self-control behaviors.

To test this prediction, I had to find a domain in which there is identifiable variation in the extent to which people tend to base their self-perceptions on their past behaviors. Based on past research, we know that men and women differ in the way they think about diet and nutrition (e.g. Campbell and Mohr 2011; Dewitte, Bruyneel, and Geyskens 2009; Fishbach, Friedman, and Kruglanski 2003). Given that women tend to process these decisions more extensively (e.g., Wardle et al. 2004), I anticipated that they might be more likely to recruit recalled information

when forming their self-perceptions and thinking about their future choices. I tested this proposition in a short pretest described next.

2.9.1 Pretest

Participants (n = 93; 58% female) were undergraduate students at a large public university in the United States who completed the study in exchange for course credit. I asked participants to imagine that they were trying to determine how good of a self-controller they are when it comes to food. I asked them to indicate how much they would use each of the following sources of information to inform their own perceptions of themselves as a controlled eater: "how I have handled previous food temptations (i.e., whether I successfully resisted them or succumbed to them)," and "how well I have been able to control my eating behavior, historically." I averaged these two items (r = .53, $p < .0001$)[2] to form an index measure of the extent to which past self-control behaviors are integrated in one's own perceptions of a good self-controller in the eating domain (i.e. a controlled eater). A one-way ANOVA conducted on this index as a function of participants' gender revealed that women are significantly more likely than men to integrate their past eating self-control behaviors in their current self-perceptions (M_{female} = 5.26, SD = 1.38; M_{male} = 4.17, SD = 1.54; $F(1, 91) = 3.85$, $p < .001$).[3]

This pretest suggests that the recollection of previous acts in the eating domain affect self-perceptions more for women than for men. This means that in the eating domain, women

[2] The results hold when we analyze these two items separately. The results were as follows: "how I have handled previous food temptations (i.e., whether I successfully resisted them or succumbed to them)," (M_{female} = 5.33, SD = 1.43; M_{male} = 4.05, SD = 1.73; $F(1, 91) = 15.26$, $p < .001$); "how well I have been able to control my eating behavior, historically" (M_{female} = 5.19, SD = 1.64; M_{male} = 4.28, SD = 2.00; $F(1, 91) = 5.72$, $p = .02$).

[3] In this pretest I also included some unrelated items measuring the extent to which present self-control behaviors or future eating plans are integrated into one's perceptions of being a controlled eater (e.g., "My current weight or diet goals," "My future eating plans"), but there are no gender differences on any of these items (all p's > .30).

should exhibit the pattern of self-control behaviors resulting from the interaction of valence x ease of recall whereas the interaction should not be significant for men. This prediction was tested in study 3.

2.9.2 Method

The study followed a 2 (valence of recalled acts: successes vs. failures) x 2 (easy vs. difficult recall) design with participants' gender as a third measured factor. Participants (n = 116; 42% female; M_{age} = 21.4 years) were undergraduate students at a large US public university, who completed the study for course credit. Participants were first told that they would complete a task for researchers interested in examining the writing styles of college students. Respondents were told that they would need to write about events that have happened to them in the past. Participants were asked to recall and describe as fully as possible instances when they were tempted to eat something delicious but very fattening and unhealthy and they either *"were able to resist the temptation and refrained from it"* (past self-control successes) or *"succumbed to this temptation"* (past self-control failures). As in prior studies, I manipulated the difficulty of recall by asking respondents to recall either 2 or 10 such instances.

Immediately after the writing task participants proceeded to a presumably unrelated food tasting task, in which they were given a cup of 50 grams of cheeseballs and asked to taste and evaluate the snack on several dimensions (e.g. crunchiness, deliciousness, overall quality). Then all respondents completed filler tasks for about 10 minutes (e.g. read an article, watched a short video) and were invited to eat as much of the snack as they wanted while working on the remaining part of the study. The amount of cheeseballs (in grams) consumed by participants

during the experiment was used as a measure of self-control. Finally, participants provided their demographic information and were dismissed.

2.9.3 Analysis and results

One outlier was removed from analysis as its value on the dependent variable was more than 2.5 standard deviations above the mean (following Tavassoli & Fitzsimons, 2006).

I conducted a three-way ANOVA on the amount of cheeseballs eaten by participants predicted by the valence of recalled acts condition, the difficulty of recall condition, and participants' gender. Results revealed a significant three-way interaction of valence of recalled acts x difficulty of recall x gender, $F(1, 107) = 6.80$, $p = .01$. Follow-up analysis demonstrated that the two-way interaction of valence x difficulty of recall was significant for female, $F(1, 44) = 4.54$, $p = .04$ (see figure 5), but not for male participants, $p = .14$.

To follow up on the significant two-way interaction in the group of female participants, I ran planned comparisons. Results showed that females whose recall of self-control successes was easy ($M = 7.36$, $SD = 5.97$) ate significantly less cheeseballs than those whose recall of successes was difficult ($M = 30$, $SD = 23.71$), $F(1, 44) = 9.21$, $p < .01$. However, there was no difference in the amount of cheeseballs consumed by female participants in the easy ($M = 16.69$, $SD = 18.30$) and difficult recall of failures conditions ($M = 18.14$, $SD = 16.14$), $p = .83$.[4]

[4] A separate posttest revealed that such gender differences in the extent to which past behaviors are integrated into the one's self-perceptions do not exist in the domains of spending self-control ($p = .71$) and task persistence ($p = .53$). This suggests that the moderating effect of gender in the eating self-control study does not invalidate any of the previous studies which were conducted in the domains of spending self-control (Studies 1A, 1B, 3, and 5) and task persistence (Studies 2A and 2B). It is only the eating domain in which women and men integrate their past behaviors into their self-perceptions to a different extent; that is why the three-way interaction of valence of recall x ease of recall x gender emerges only in this study.

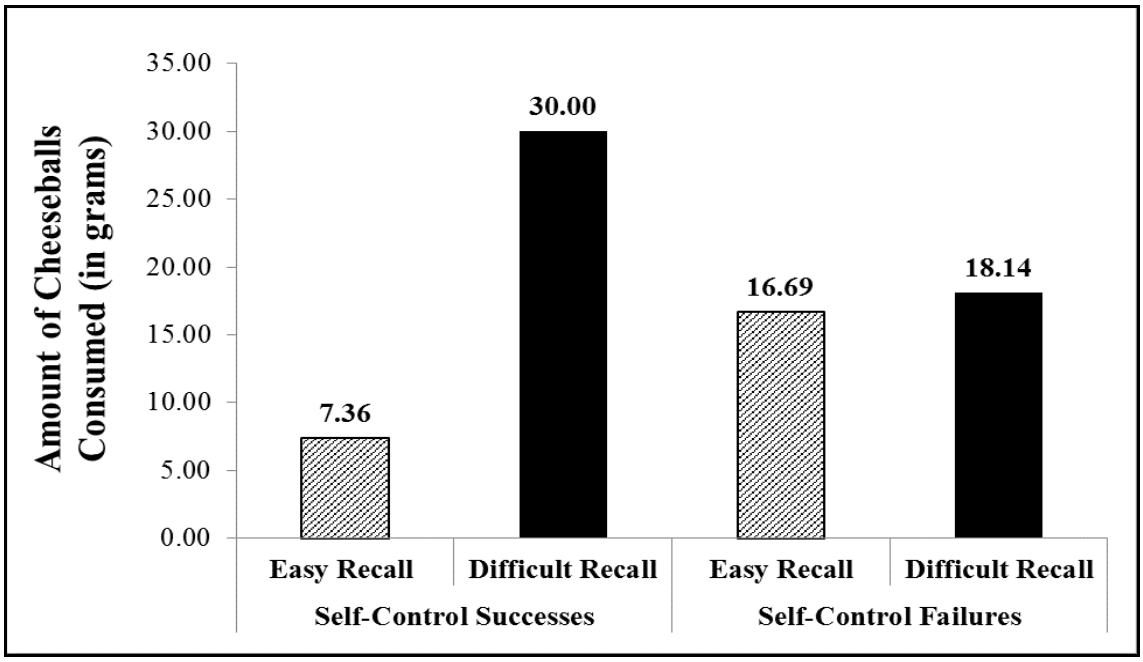

Figure 5. Interaction of Recalled Act Valence and Retrieval Difficulty on Amount of Cheeseballs Consumed (Female Participants Only)

2.9.4 Discussion

Results provide evidence of the underlying process by demonstrating that the hypothesized effects of valence and difficulty of recall on self-control emerge only for consumers who use their past self-control behaviors to inform their beliefs about their self-control ability but not for those who are less likely to base their self-perceptions on their past behaviors. Results showed that women are more likely than men to integrate their past behaviors into their self-perceptions in the eating domain. Thus, women (but not men) exhibited the predicted interactive effects of valence and difficulty of recall on current self-control when faced with a real eating temptation. Thus, by demonstrating a moderation of the recall (valence and difficulty) – self-perceptions link in our conceptual model, Study 4 provides evidence of the mechanism underlying the effects of valence and difficulty of recall on current self-control. The next study again provides process evidence but by showing a moderation of the self-perceptions – current self-control link in our

model and highlighting that consumers use their self-perceptions to guide their current behaviors in some situations but not in others.

2.10 STUDY 4

Recall that my theory suggests that the recall of self-control acts prompts consumers to form beliefs about their overall self-control ability and that consumers tend to act consistently with those self-control beliefs formed on the basis of their recollections. However, past research suggests that individuals' self-beliefs usually differ in the certainty with which they are held (Baumgardner 1990). Self-certainty reflects the degree to which people believe that they know themselves well and are certain in the type of person they are or the traits that they possess (Baumgardner 1990; DeMarree, Petty, and Brinol 2007). Past research also reveals that people with a certain self-view (i.e., people who believe that they know themselves relatively well) are more likely to use their self-knowledge to guide their decisions and behaviors (DeMarree at el. 2007; Petty et al. 2007; Setterlund and Niedenthal 1993; Visser, Bizer, and Krosnick 2006). In contrast, lack of certainty usually inhibits the use of the construct which an individual is uncertain about (DeMarree et al. 2007; Petty et al. 2007; Visser et al. 2006); thus, for individuals with an uncertain self-view, their self-conceptions are less likely to influence their actions. Based on this research and given my theory, I anticipate that consumers will use their self-control perceptions to guide their current decisions only when they are certain about those self-conceptions. In contrast, when consumers are prompted to doubt their self-conception, they will not use those beliefs as a guide for their self-regulation. In other words, I expect that I will

replicate the effects of valence and ease of recall on current self-control in conditions of high self-certainty, but the effects will be attenuated in conditions of low self-certainty.

2.10.1 Method

My past studies have uniformly found null results when failures are recalled. As such, study 4 focuses on testing the moderating effect of self-certainty in the recall of past self-control successes condition. Consequently, study 4 used a 2 (easy vs. difficult recall of successes) x 2 (low vs. high self-certainty) between-subjects design. English-speaking participants (n = 98, 60% female, $38,147 mean income) were recruited through an online panel and asked to complete several unrelated tasks in exchange for a small payment. The first task, which was framed as a personality test, included both the recall difficulty and the self-certainty manipulations. Specifically, participants responded to a set of personality questions and were asked to recall and describe past experiences as a part of the personality test. Participants in the easy recall condition described 2 past instances in which they were faced with a spending temptation and they were able to successfully control their spending behavior; participants in the difficult recall condition were asked to retrieve 10 such instances. At the end of the personality test, participants were given bogus feedback regarding their personality profile. Participants in the high self-certainty condition were told that based on their responses, the computer program was able to easily construct a clear and consistent personality profile of who they were. In contrast, participants in the low self-certainty condition were told that the computer program could not compute a clear personality profile (following Morrison and Johnson 2011).

In the second task participants were asked to prepare a monthly budget and allocate a total monthly budget of $2,500 among three categories: necessities, luxuries, and savings. In

order to ensure the effectiveness of the self-certainty manipulation, participants were also asked to indicate their agreement with the following statement: "The personality test results made me feel certain about who I am." on a 7-point scale anchored by 1 = "Strongly Disagree" and 7 = "Strongly Agree.". Finally, participants also provided their demographic information.

2.10.2 Analysis and results

2.10.2.1 Manipulation check

I ran a two-way ANOVA on the self-certainty measure as a function of the recall difficulty condition, the self-certainty condition, and their interaction. Results revealed only a significant main effect of the self-certainty condition, $F(1, 93) = 14.31$, $p < .001$, such that respondents in the low self-certainty condition ($M = 3.70$, $SD = 1.54$) were less certain in their self-view than those in the high self-certainty condition ($M = 4.78$, $SD = 1.30$).

2.10.2.2 Preference for luxuries versus necessities

I was interested in consumers' relative preference for luxuries as opposed to necessities when creating a monthly budget. As savings in this case could be available in the short-term, it could be subsequently used for either luxuries or necessities. Hence, the amount in savings in this case cannot be cleanly interpreted as a measure of self-control. However, the inclusion of the savings category allows the two amounts to be mathematically independent of one another (following Poynor and Haws 2009). Thus, for this study my outcome variable was created by dividing the amount of money budgeted for luxuries by the amount of money budgeted for necessities (hereafter referred to as the indulgence ratio).

I estimated a two-way ANOVA in which participants' indulgence ratio was predicted by the recall difficulty condition, the self-certainty condition, and their interaction. Results revealed only a significant interaction of the two factors, $F(1, 94) = 7.52$, $p < .01$, shown in figure 6. Follow-up analyses showed that in the high self-certainty condition results replicated our previous findings: participants whose recall of self-regulation successes was easy budgeted significantly less money toward luxuries relative to necessities ($M = .38$, $SD = .27$) than those whose recall was difficult ($M = .63$, $SD = .73$), $F(1, 94) = 4.65$, $p = .03$. In contrast, in the low self-certainty condition I see a marginally significant reversal of the previously observed effects: respondents who recalled two self-control successes (easy recall) allocated slightly more money toward luxuries relative to necessities ($M = .51$, $SD = .30$) than those who retrieved ten such instances (difficult recall, $M = .30$, $SD = .22$), $F(1, 94) = 2.98$, $p = .09$).[5]

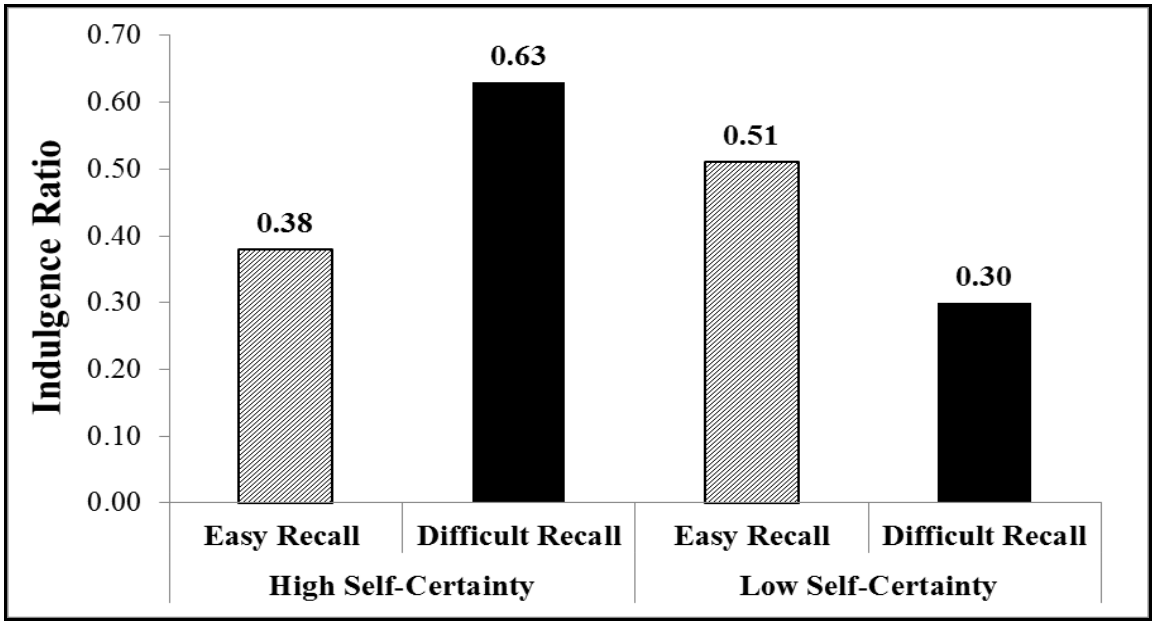

Figure 6. Interaction of Retrieval Difficulty and Self-Certainty on Indulgence Ratio (Successes Condition Only)

[5] Given the nature of the data and the dependent variable in this study, I checked whether there were any significant main or interactive effects of participants' income. Results revealed no main effects or interactions of income with the manipulated variables, all *p's* > .23.

2.10.3 Discussion

Study 4 both provides replication of our prior findings and shows moderation consistent with our theoretical account. Specifically, in conditions of high self-certainty, individuals whose recall of past successes was easy exhibited significantly better self-control than those for whom the recollections of past self-regulation successes was more difficult. In contrast, in conditions of low self-certainty, results showed that the previously demonstrated effects were attenuated and even reversed to some extent. In cases when participants were uncertain about their self-view, individuals who recalled two past self-control successes (easy recall) were more likely to indulge than those who recalled ten successes (difficult recall). Since consumers who are uncertain about their self-views are less likely to use their self-perceptions as a guide for their actions (DeMarree et al. 2007; Petty et al. 2007; Visser et al. 2006), they might use the recalled experiences in a completely different way (Schwarz 2004). It may be that low self-certainty individuals simply use the past behaviors as data points to gauge the frequency of their past indulgences and restraints (Aarts and Dijksterhuis 1999). Thus, when the recall of self-control successes is difficult, individuals may assume that they restrained fairly infrequently in the past. By contrast, when recall of self-control success is easy, consumers feel that they have restrained fairly frequently. As a result, they are more likely to indulge when they believe that they have restrained enough in the past (easy recall of successes) than when they believe that their past restraints are insufficient to justify a present indulgence (difficult recall of successes). I note that my results are inconclusive regarding this possibility, however, and that future research may explore this further.

Finally, it should be noted that the findings from both Studies 3 and 4 rule out depletion as an alternative account of the proposed effects of valence and ease of recall on current self-

control. For instance, an alternative explanation for the reported findings might be that the interplay of valence and ease of recall creates different levels of depletion, leading to differences in current indulgence. If that were the case, we would expect that in the last two studies our pattern of effects would emerge irrespective of participants' gender (study 3) and the self-certainty manipulation (study 4). However, the moderation results of the last two studies rule out depletion as an alternative mechanism because it is unreasonable to expect that women and men experienced different levels of depletion resulting from the recall task or that the self-certainty manipulation could have changed participants' felt depletion.

2.11 GENERAL DISCUSSION

Across seven studies, I explore two dimensions of consumers' recall of past self-regulation behaviors - (1) the valence of recalled acts (successes or failures) and (2) the metacognitive information provided by their subjective ease of retrieval – and how their interplay influences current self-control. Seven studies provide evidence that recalling failures is less helpful to present self-control than is recalling successes: in the domain of self-control, thinking positively may be a better strategy than is dwelling on past failures. However, this advice should be given with a caveat: recalling success is only beneficial for long-term goal pursuit when the retrieval of those acts is subjectively easy. I note that these effects hold in eating (study 3), spending (study 1B, willingness to incur debt; study 4, ratio of luxuries to necessities in budgeting), and savings-related decisions (study 2B, contribution to a 401K plan), as well as real self-control behaviors in the task persistence domain (study 2A, persistence on a challenging task; study 2C, time allocation).

Furthermore, results suggest that the joint impact of valence and ease of recall on current indulgence is driven by consumers' perceptions of their self-control ability formed on the basis of their recollections of past self-regulation behaviors. I also highlight that the impact of recall on current self-control is attenuated for consumers who do not integrate their past self-control behaviors into their self-beliefs and in situations of low self-certainty when one's self-perceptions are no longer used to guide current behavior.

This research makes a number of important theoretical contributions. First, my work emphasizes the importance of considering both the valence of recall and the metacognitive information provided by the subjective ease or difficulty of retrieval when examining how recall of self-regulation episodes affects current self-control. My work thus builds directly on recent work in self-control, extending prior findings in ways that are both practically and theoretically important. First, I extend the work of Mukhopadhyay et al. (2008), who show that the recall of past food-related temptations, which were either successfully resisted or succumbed to (success versus failure respectively), interacts with consumers' chronic impulsivity to influence their current self-control behaviors. I first extend their work by demonstrating that the valence of recalled acts interacts not only with individual factors, but also with contextual variables, such as the subjective difficulty of one's recall, to influence self-control. Further, I show that the joint impact of valence and ease of recall on current indulgence interacts with consumers' self-certainty, showing that it alters the way in which information from memory is used.

Second, I build on the body of literature arguing that consumers' own mental operations can influence their present self-control even when a depletion of self-regulatory resources might not be at play. The present research also extends the work of Job et al. (2010) who showed that individuals' lay theories about willpower as a limited or unlimited resource can affect their self-

control. While Job et al. (2010) focused on people's *general* theories about the depletability of self-regulatory resources and their effect on self-control, my research emphasizes that individuals' beliefs about their *own* self-control tendencies derived from the recall of past episodes also play an influential role in determining how well they self-regulate in the present, and do so without observable depletion effects.

Third, my work contributes also to the ease-of-retrieval literature by showing that the ease-of-retrieval heuristic has asymmetric effects in the case of recalling prior self-control behaviors. That is, consumers use the ease-of-retrieval heuristic when they recall successes but not when they retrieve failures because the negative impact that failures recall has on mood reduces reliance on the ease-of-retrieval heuristic. Thus, I respond to the call of Ruder and Bless (2003) for further research into the conditions limiting the use of metacognitive information.

Fourth, past research has focused on balancing and licensing as explanations for the effect of past behaviors on present actions (Khan and Dhar 2006). I show that at least in some situations, recollection may influence present behavior simply due to a tendency to be self-consistent, showing consumers' adoption of a less-complex decision-making heuristic. The need for self-consistency is often described as fundamental human motive (Lecky 1945), comparable to other drivers such as hunger and thirst (Festinger 1957). The desire to be self-consistent is so powerful that individuals have great interest in acting consistently with their self-views even when those views are negative (Kwang and Swann, Jr. 2010). My research extends such findings by showing that the desire for self-consistency also drives self-regulation, even when depletion does not appear to be operating and when doing so may lead to repeated failures.

Fifth, I demonstrate that consumers' self-certainty determines when recall of past episodes produces self-consistency versus switching behaviors (e.g., licensing or balancing). My

research reveals that when consumers are certain in their self-beliefs, they behave consistently with their self-control perceptions formed by their recall of past behaviors. On the other hand, when consumers experience low self-certainty, they are more likely to engage in switching behaviors. Thus, it appears that in high self-certainty conditions, individuals may use the past to form global, impactful self-evaluations, while in low self-certainty conditions, consumers use past information in a more heuristic sense, simply to determine their next action by virtue of the perceived frequency of past actions.

Finally, my work also makes a methodological contribution by introducing a novel real-behavior self-control task which could be of interest to other self-control researchers. Specifically, in study 2C I designed and pretested a videos watching task which presents individuals with a real self-control dilemma of how to allocate their time and which could easily be implemented online. Given the current ease of collecting data online, I believe that this videos watching task would allow researchers to easily incorporate real-behavior self-control dependent variables into their work in the self-regulation domain.

Practically, my findings are relevant to consumers, practitioners, and public policy makers who wish to overcome problems such as obesity, procrastination, and consumer debt. I show that while recalling successes seems like a good idea, in cases when such recall is difficult, this strategy may backfire. And compared to easy recall of successes, recalling failures does little to enhance self-control, despite conventional wisdom that one learns from their past mistakes. In fact, my results instead argue that focusing on one's past mistakes may doom us to repeat them. Furthermore, my findings suggest implementable tools that can be used to impact consumers' behaviors. For instance, external advertising cues can create effects consistent with those created by explicit recall directions (study 2B). Therefore, messages that aim to increase retirement

savings and decrease debt, as well as financial advisors might be able to influence consumers' spending behaviors by simple messages that prompt them to reflect on their past self-control successes in a subjectively easy manner or uncomplicated setting.

Finally, my findings also offer interesting possibilities for future research. Here, I allowed participants to think about whatever came most easily to mind when recalling successes or failures. Future research, however, could explore whether a more direct cue to think about the negative consequences of failures would lead to better self-control. Notably, there are likely circumstances for which recall of past failures is quite useful as a self-control strategy, and having people focus on the consequences of their behavior may be one way to enhance the effectiveness of recall of past indiscretions. Further, we do not know how the strategy of recalling past self-regulation behaviors might compare to other self-control strategies (e.g., Hoch and Loewenstein 1991). Future research may explore the question of when recall strategies are most effective, or when other approaches would yield better results while building on our present framework regarding the valence, difficulty, and self-perceptions involved with self-control operations.

3.0 ESSAY 2: STRATEGIES TO COPE WITH SOCIAL IDENTITY THREATS: DEFENDING THE SELF WITHOUT SABOTAGING SELF-CONTROL

People often encounter situations when important aspects of their identities are negatively evaluated and threatened. Imagine a diehard football fan who watches his beloved team lose miserably to an objectively "worse" opponent. Consider a college student majoring in business who reads that business students perform worse than engineering students in college. Or even imagine the experience of a young computer scientist who while waiting for a table in an upscale restaurant overhears people laughing about how computer scientists are nerdy, boring, and awkward. Situations such as these are called social identity threats and they abound in our lives, devaluing or undermining key elements of who we are, and causing us to seek effective ways to cope with them.

Extant research reveals that social identity threats cause aversive psychological consequences (Baumgardner 1990), which motivate individuals to seek ways to cope with those threats and repair their self-worth (Steele 1988; Tajfel and Turner 1986). Unfortunately, the act of coping with social identity threats has detrimental downstream consequences for people, such that it hinders their self-regulation and ability to act in accord with their long-term goals (e.g., Inzlicht and Kang 2010; Inzlicht, McKay, and Aronson 2006). For instance, a growing body of research reveals that sports defeats, which are significant identity threats for fans, are associated with increased domestic violence incidences (Card and Dahl 2011), driving fatalities

(Redelmeier and Stewart 2003; Wood, Mcinnes, and Norton 2011), aggression- and alcohol-related criminality such as DUIs, vandalism, and assaults (Rees and Schnepel 2009), and poor food choices (Cornil and Chandon 2013). Furthermore, Inzlicht and Kang (2010) demonstrate that individuals who experienced a stereotype threat (a form of social identity threat) exhibited impaired self-control in subsequent decisions, behaving more aggressively, consuming a greater amount of an unhealthy food, and making less rational decisions in comparison to non-threatened individuals.

In summary, research suggests that coping with social identity threat damages individuals' self-control in subsequent decisions. However, previous research has treated the process of coping with identity threats as a unitary construct or even as a "black box." In other words, while researchers have been focused primarily on studying the consequences of social identity threat coping, little attention has been given to understanding and differentiating the various strategies that people could potentially use to cope with an identity-threatening situation. Thus, there are few insights as to whether the different coping strategies individuals use to manage social identity threats are equally costly to self-control. An interesting question, then, is whether certain coping strategies are more damaging to self-control than others. Might some strategies allow people to restore their self-worth following a social identity threat without undermining self-control? For instance, would the computer scientist choose a healthier dinner if he manages the social identity threat using certain strategies rather than others?

The present research addresses this question. Like research on emotion-focused coping that has examined the advantages and disadvantages of different emotional regulation strategies (e.g., suppression versus reappraisal; Gross 1998), I argue that research on social identity threats coping can also be enriched by exploring the deeper question of how the *different* coping

strategies might have differential downstream consequences. I take the first step towards addressing this gap in the literature and examine the impact of two strategies for coping with social identity threats on self-control. Specifically, I look at two common strategies, namely the social creativity strategies suggested by Tajfel and Turner (1979; 1986), which involve "highlighting positive dimensions of the self" on which the in-group is superior to the out-group or "emphasizing intergroup differences that reflect positively on the in-group". I refer to these strategies as *superior self-aspects* and *inferior others* respectively, and demonstrate that while they are equally effective at repairing the self, they differentially impact subsequent self-control. Specifically, the superior self-aspects strategy leads to better self-control in later tasks than does the inferior others strategy.

Furthermore, I identify the mechanism underlying the proposed effects: accessibility of self- versus out-groups-knowledge. I demonstrate that a social identity threat activates the self, making self-knowledge more accessible. The superior self-aspects strategy, which highlights additional self-dimensions, maintains a mental focus on the accessible self, conserving self-regulatory resources. However, the inferior others strategy requires the individual to shift his thoughts from active self-knowledge to relatively less accessible out-groups knowledge, consuming self-regulatory resources and undermining subsequent self-control. As a result, individuals perform better in self-control challenging situations after the use of the superior self-aspects strategy than after the inferior others strategy.

The present research contributes to both the social identity and self-regulation literatures. First, our work contributes to the social identity literature in two key ways. Specifically, I shed light on the use and effects of two social creativity strategies for coping with identity threats (Tajfel and Turner 1986) that are frequently used but largely unexamined by researchers.

Moreover, to the best of my knowledge, this is the first research to examine differences between the various coping strategies used to manage social identity threats. While past research has studied different coping strategies in isolation from one another (e.g., Branscombe and Wann 1994; Cheryan and Monin 2005; Doosje, Ellemers, and Spears 1995; Maas et al. 2003; White and Argo 2009), currently there are few insights about the costs of each strategy, whether certain strategies are more appropriate to use than others, when and under what conditions this is the case, and why. This research takes a first step toward filling this gap in the literature by comparing two different coping strategies, while focusing on how they influence individuals' subsequent self-control.

Second, this work contributes to research focused on studying the interrelationship between social identity and self-control. While past research demonstrates that coping with social identity threats leads to poor self-control (Cornil and Chandon 2013; Inzlicht and Kang 2010; Inzlicht et al. 2006), I show that this relationship depends on the specific coping strategy used, with certain strategies allowing people to repair their self-worth without significantly undermining self-control. Precisely, my contribution above and beyond the related work is twofold: (1) I examine the specific coping strategies that individuals use to cope with a social identity threat (treated as a "black box" in previous research); (2) my work shows that not all coping strategies negatively impair subsequent self-control; in fact, my findings reveal that the self-control exhibited by individuals using the superior self strategy was comparable to that of non-threatened individuals.

Finally, the current research has important implications for individuals' well-being and contributes to the self-control literature by revealing an effective strategy that reduces the negative impact of social identity threats on self-control. My research suggests that individuals

can benefit from knowing the differences and self-regulatory costs of the two social creativity strategies, revealing that the superior self-aspects approach preserves limited self-regulatory resources and allows people to make healthier food choices and wiser spending decisions.

In what follows, I briefly review research on social identity threats, develop the hypotheses regarding the differential impact of the two coping strategies on self-control and the mechanism underlying these differences, and then present a series of field and lab studies that provide empirical support for my propositions. I conclude with a discussion of the theoretical contributions, practical implications, and directions for future research.

3.1 SOCIAL IDENTITY THREATS

Identity theory defines an individual's self-concept through two aspects: personal identity, comprised of the individual's traits and attributes, and social identity, derived from his membership in different social groups (Tajfel and Turner 1986). Social identity has gained considerable attention by researchers (e.g., Davis, Spencer, and Steele 2005; Ethier and Deaux 1994; Logel et al. 2009; Nadler, Harpaz-Gorodeisky, and Yael 2009; Oyserman 2009; Oyserman, Fryberg, and Yoder 2007; Reed et al. 2012; Sinclair, Hardin, and Lowery 2006; Van Vugt and Hart 2004; White and Dahl 2007), as research has found that behavior is better predicted by discrete social identities than by the global self-concept (Kleine, Kleine, and Kernan 1993).

As social identities provide both organization and coherence to the self-concept, individuals are motivated to maintain positive views of their social identities (Abrams and Hogg 1998). Yet they often find themselves in situations where their social identities are negatively

valued or threatened. Such social identity threats are characterized by thoughts, feelings, behaviors, or experiences that challenge the positive view of one's social identity (Breakwell 1983) and can occur in various forms, such as in-group value threats, stereotype threats, prototypicality threats, and distinctiveness threats (Branscombe et al. 1999). Individuals who see the threat as relevant to important self-structures (Boninger, Krosnick, and Berent 1995; Ellemers, Spears, and Doosje 2002) then experience numerous aversive consequences, such as weakened task performance (Steele 1997), avoidance of situations in which the in-group is threatened (Major et al. 1998), and diminished physiological and psychological well-being (Cole, Kemeny, and Taylor 1997; Major and O'Brien 2005). To avoid or reduce such negative consequences, individuals often implement various strategies aimed at repairing the self (e.g., Branscombe and Wann 1994; Cheryan and Monin 2005; Steele 1988; Tajfel and Turner 1986).

While coping with social identity threats repairs self-worth, it also undermines subsequent self-control (Inzlicht and Kang 2010; Inzlicht et al. 2006). As identity-threatening situations require individuals to alter their thoughts and behaviors to restore the positive view of their social identity, such efforts consume self-regulatory resources and subsequently lead to self-control lapses (Karoly 1993; Muraven and Baumeister 2000). For instance, Inzlicht and colleagues (2006) demonstrate that stigmatized individuals use their limited self-control resources to repair their devalued social identities and then exert less self-control in other domains compared to non-stigmatized individuals. In addition, coping with stereotype threats (a form of identity threat) depletes individuals and leaves them unable to control their subsequent behaviors, leading them to behave more aggressively, eat more unhealthy foods, and make riskier decisions (Inzlicht and Kang 2010).

However, do all coping strategies *equally* impair subsequent self-control? My work extends this research by examining whether different strategies for coping with social identity threats are equally detrimental to subsequent self-control, and the process through which these differences may occur. I focus on two common strategies for coping with social identity threats which have remained largely unexamined by previous researchers, namely the two social creativity strategies identified by Tajfel and Turner (1986). In the next section, I describe these strategies in greater details and derive my predictions regarding their differential effects on subsequent self-control.

3.2 STRATEGIES FOR COPING WITH SOCIAL IDENTITY THREATS AND THEIR IMPACT ON SELF-CONTROL

I examine two specific strategies for coping with social identity threats: both are social creativity strategies, in that they seek "positive distinctiveness for the in-group by redefining or altering the elements of the comparative situation" (Tajfel and Turner 1986). In other words, these two strategies attempt to modify the threat-producing judgment to produce more positive evaluations of the in-group, thus repairing the threatened social identity. Two approaches could make the threatening comparison less intimidating: one could emphasize other good identity traits instead of focusing on the threatened dimension, or one could bring to mind other out-groups that perform even worse than the in-group on the threatened dimension

The first coping strategy is referred to as *superior self-aspects* and involves "comparing the in-group to the out-group on some new dimension" (Tajfel and Turner 1986). For example, Lemaine (1966) demonstrated that children's groups which compared unfavorably to other

groups in terms of constructing a hut (because of poor building materials) used other comparison dimensions on which they performed better than the out-group, such as the hut's surroundings. Lalonde (1992) showed that hockey teams at the bottom of the league emphasized the fact that top teams tended to play "dirty"; thus, those threatened hockey players essentially changed the comparison dimension from game performance to ethical sportsmanship to restore their positive self-view. In practical terms, this strategy implies that the individual ignores or downplays the threatened self-aspect and instead focuses on or emphasizes other positive self-aspects on which they are superior to the contrasting out-group. For instance, a sports fan who reads that fans of his favorite team are considered "ruder and more ignorant" than other fans might instead think, "we may not be polite, but we are more loyal and enthusiastic fans than them."

The second strategy for dealing with social identity threats involves "changing the out-group with which the in-group is compared" to avoid using a higher-status out-group as a comparison point (Tajfel and Turner 1986). In other words, when coping with a social identity threat, individuals may strategically compare themselves with out-groups that tend to perform worse on the threatened identity dimension and emphasize intergroup differences which reflect positively on their in-group (Tajfel and Turner 1979). Evidence for the use and effectiveness of this strategy was shown by Rosenberg and Simmons (1972), who found that when African-Americans made self-comparisons to other African-Americans their self-esteem was higher than when Caucasians were used as a comparative frame of reference. In essence, this strategy (referred to as *inferior others*) suggests that individuals remain focused on the poor-performance dimension, but selectively think about other groups that perform *even worse* on that dimension. For example, the threatened NFL fan might acknowledge the crassness of his hometown fans but

bring to mind the fans of other cities who are even worse, thinking "Steelers fans might not be polite, but at least they aren't as rude as Eagles fans—they have no decency at all!"

While other strategies for coping with social identity threats have been proposed, such as individual mobility or social competition (Tajfel and Turner, 1986), I focus on the two social creativity strategies for both theoretical and practical reasons. Theoretically, these strategies are conceptually similar as they both involve cognitive processes aimed at changing elements of the comparative situation to restore the positive social identity. Practically, both strategies offer subtle and easily implementable cognitive forms of coping with social identity threats, which could be executed in almost any identity threatening situation. While other strategies, such as individual mobility (leaving the threatened group) or social competition (engaging in direct competition with the out-group) might be impossible in some circumstances (e.g., if an individual's ethnic identity is threatened, he cannot simply leave the threatened group), the two social creativity strategies can be applied to most social identity threats as they only require subtle cognitive changes and thus are more frequently used by people than other strategies.[6]

To make predictions about the effects of the two coping strategies on self-control, it is first necessary to propose a framework for the cognitive effects of an identity threat. I propose that a threat to a specific dimension of an individual's social identity will activate and make this particular threatened attribute of the self more accessible. Past research demonstrates that identity threatening situations lead to increased identity salience and stronger in-group identification (Christian et al. 1976; Forehand, Deshpandé, and Reed 2002). Importantly, this heightened activation of the identity and its accompanying knowledge structures should only

[6] A pilot study (n = 122) assessed the frequency of using the four different coping strategies proposed by Tajfel and Turner (1986). Results revealed that two social creativity strategies ($M_{superior\ self}$ =5.47; $M_{inferior\ others}$ = 4.10) are more commonly used by people than the individual mobility ($M_{ind\ mobility}$ = 3.20) and social competition ($M_{soc\ competition}$ = 3.44) strategies (all *p's* < .01).

occur for those individuals who strongly identify with the threatened social identity (Ellemers et al. 2002). Individuals who only weakly identify with, or do not possess, the threatened identity should find the threatening situation irrelevant; and thus experience no salience effects.

Furthermore, due to spreading activation (Anderson 1983), the activation of the threatened aspect of the self should lead to activation and increased accessibility of other aspects of individuals' self-concept (Kleine et al. 1993). Spreading activation can be incorporated into the proposed effects of coping strategy on self-control as it is widely recognized that an individual's self-concept is a unique knowledge structure in memory (Kleine et al. 1993; Markus 1977). Consequently, spreading activation processes, characteristic of general human knowledge, are also likely to occur in an individual's identity knowledge structure. In sum, after the experience of a social identity threat, an individual's self-knowledge (i.e., knowledge of all traits defining one's identity) becomes more accessible and salient for use in further cognitive processing (Carver 1975; Macrae, Bodenhausen, and Milne 1998).

Once the social identity threat has registered with the individual and activated his self-knowledge, he is motivated to cope with the threat and repair his social identity. In the coping process, the individual might rely on one of the two social creativity strategies focused on in this research. As described above, while both strategies share the characteristic of changing the social comparison, each does so through distinct routes. The inferior others strategy requires individuals to think about out-groups that perform worse on the threatened dimension, creating a favorable intergroup comparison between the second-rate out-group and the in-group. This implies that implementing the inferior others coping strategy shifts thoughts from active self-knowledge to relatively inactive others-knowledge. Specifically, previous research has found that when the self becomes the focus of attention, individuals are particularly likely to behave in

accordance with internal self-traits (Carver 1975; Macrae et al. 1998). Therefore, shifting away from active self-knowledge requires effortful, controlled processing (Greenberg et al. 1994) which depletes self-regulatory resources and increases self-control failures in subsequent situations. Past research also shows that thought-control depletes the limited pool of self-regulatory resources (Wegner et al. 1987), as does strategically altering one's thoughts, feelings, and behaviors (Ellis and Ashbrook 1989; Gailliot, Schmeichel, and Baumeister 2006). Thus, I propose that utilizing the inferior others coping strategy requires individuals to effortfully shift their thoughts from the active self to the inactive others, reducing their self-regulatory resources and leading to subsequent self-control failures. In contrast, the superior self-aspects strategy requires individuals to highlight other positive dimensions of the self, remaining focused on accessible concepts. As the social identity threat has activated both the threatened self-dimension and broader self-aspects, I predict that this coping strategy will not consume a significant amount of self-regulatory resources. Even though both strategies involve changing one element of the comparison situation, I propose that changing the comparison attribute (as required by the superior self-aspects strategy) would be easier for people than changing the comparison group (as required by the inferior others strategy) since individuals' self-knowledge has been activated as a result of the identity threat experience. In sum, I hypothesize:

H1: Individuals who use the superior self-aspects strategy to cope with a social identity threat will exhibit better self-control in subsequent situations than those who implement the inferior others strategy.

H2: The differential effect of coping strategy on subsequent self-control will only be true for individuals who strongly identify with the threatened social identity.

I further predict that these differences in self-control occur because:

H3: A social identity threat will activate the self and heighten the accessibility of self-knowledge.

H4: The shift in thoughts from accessible self-knowledge to inaccessible out-groups knowledge, required by the inferior others strategy will consume self-regulatory resources; in contrast, the superior self-aspects strategy will not require self-regulatory resources to enact since it involves retaining the thoughts on the accessible self.

I test these hypotheses in one field study and seven experiments. The field study demonstrates that the inferior others strategy is more detrimental to subsequent self-control than the superior self-aspects strategy using a real-world setting, a naturally occurring social identity threat, and participants' actual food purchases as a measure of self-control. Again with actual food consumption, study 1 replicates these findings in a controlled lab environment, with a different social identity. Studies 2A and 2B consider the interplay of the two coping strategies and people's identification with the threatened social group on subsequent indulgence. Using two different self-control domains (spending and eating), these two experiments demonstrate that the inferior others strategy is more detrimental to subsequent self-control than is the superior self-aspects, but only for individuals who identify strongly with the threatened in-group and not those with weak in-group identification for whom the threat is not relevant (non-threatened individuals). Study 3 replicates these findings using advertising stimuli in which I embed both the social identity threat and coping strategy cues, demonstrating that even subtle manipulations of the coping strategies can lead to the predicted effects. Finally, the last three experiments provide evidence for the proposed mechanism: study 4A demonstrates that encountering a social identity threat increases the accessibility of the self; studies 4B and 4C show that increasing the accessibility of out-groups knowledge reduces the detrimental impact of the inferior others strategy on self-control.[7]

[7] I note that we do not cross the coping strategy condition with a threat vs. no threat condition in any of the experiments because the strategy implementation is not possible in the absence of a threat. I instead examine the

3.3 FIELD STUDY

The field study tests whether utilizing the two different strategies to cope with social identity threats differentially impacts subsequent self-control. I conducted this study in a coffee shop, used a naturally occurring social identity threat in the environment, and assessed participants' self-control by examining their actual purchases.

3.3.1 Method

To take advantage of a naturally-occurring social identity threat, I conducted the study on the days following two painful losses of the local NFL team (hereafter called Team X). I intercepted participants at the entrance of a coffee shop located on-campus of a large public university and asked them to participate in a short study in exchange for $2. Respondents (n = 38, 37% female) were individuals who indicated that they considered themselves to be fans of Team X and who had watched the game the previous night. The study used a 2 (Coping Strategy: superior self-aspects, inferior others) group design. In order to remind participants of the social identity threat, a large poster notified them that they could participate in a quick survey about the "loss of Team X last night" and displayed the game score. The survey contained two parts. In part 1, participants were randomly assigned to one of the two coping strategies and were asked to complete five sentences in response to Team X's loss the previous night. Participants in the superior self-aspects condition completed sentences beginning with: "Yesterday Team X made

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moderating effect of strength of identification with the threatened identity and use participants with weak in-group identification (in studies 2A, 2B, and 3) as a proxy for the no-threat condition.

more mistakes than Team Y, but Team X were still better than Team Y at…". In contrast, respondents in the inferior others condition filled out five sentences beginning with: "Yesterday Team X made more mistakes than Team Y, but at least they did not mess up as badly as…" Participants were told that they could fill out as many sentences as they want. The average number of sentences completed was 4 and did not differ between the two conditions (p = .37).

After completing part 1 of the survey, participants entered the café to purchase their meals and/or drinks, and were asked to come back to the experimenter to complete the second part of the survey. In part 2, participants answered demographic questions, described their purchases, provided their receipts, and received payment.

3.3.2 Analysis and results

I obtained the nutritional information of all participants' meals and drinks from the website of the coffee shop. I used the total grams of fat and amount of calories in participants' purchases as a measure of their self-control, such that higher fat and calories content signaled less self-control (Fujita and Han 2009).

Consistent with previous research (e.g., Tavassoli and Fitzsimons 2006), before proceeding with the analysis I screened the data for outliers and excluded one respondent whose values on the dependent variables were more than 2.5 standard deviations above the mean. To account for the relationship between the two dependent variables (r = .846, p < .0001), I conducted a one-way MANOVA on the total grams of fat and number of calories in participants' purchases predicted by the strategy condition. Results revealed a significant main effect of the strategy condition, Wilks's lambda = .842, multivariate $F(2, 34) = 3.19$, p = .05. The purchases of participants in the inferior others condition contained significantly more fat and calories (M_{fat}

= 16.52g, *SD* = 10.76; M_{cal} = 463, *SD* = 202.95) than those of respondents in the superior self-aspects condition (M_{fat} = 8.87g, *SD* = 8.83; M_{cal} = 287, *SD* = 212.82), $F(1, 35) = 5.19$, $p = .03$ and $F(1, 35) = 6.46$, $p = .02$ respectively.

3.3.3 Discussion

This field study provides the first evidence in support of my prediction, using a real world setting in which people's social identity was threatened by a naturally occurring event (the loss of their favorite football team) and where the differential impact of the two coping strategies on self-control was reflected in their actual purchasing behaviors. In line with my theory, participants who used the superior self-aspects strategy to cope with the loss of their favorite football team made healthier choices and purchased foods containing less fat and calories than those using the inferior others strategy. In fact, individuals who used the latter strategy consumed meals which had 86% more fat and 61% more calories than those who utilized the former strategy. These results build on the findings of Cornil and Chandon (2013) who showed that sports defeats increase unhealthy eating; but importantly I highlight that the strategy that people use to cope with the identity-threatening experience moderates this effect. Thus, this initial field study suggests that individuals may attenuate the negative impact of identity threats on self-control by using the superior self-aspects strategy rather than the inferior others one.

Given that the field experiment demonstrated the differential impact of the two social creativity coping strategies on self-control in a naturalistic consumption setting, the next study aims to provide evidence of this proposition in a controlled lab environment. In study 1 I induce a social identity threat and manipulate coping strategy usage, and use participants' actual food

consumption as a measure of their self-control. Moreover, in study 1 I threatened a different social identity of our participants - their identity as business students.

3.4 STUDY 1

3.4.1 Method

Study 1 used a 2 (Coping Strategy: superior self-aspects, inferior others) group design. Participants (n = 44, 64% female) were students pursuing a business degree at a large public university and completed two ostensibly unrelated studies for course credit. Specifically, participants encountered the identity threat and were directed to use a specific coping strategy in the first study. I manipulated the social identity threat by asking participants to imagine that they were having a conversation with a group of friends in the school cafeteria. While chatting, one friend mentioned a recent newspaper article that discussed how business students tend to perform significantly worse academically than engineering students (see Appendix B). After reading the article, participants were asked to imagine how they would respond to the criticisms of business students. At this point, participants were assigned to one of the two coping strategies.

In both conditions participants completed five sentences that began with precise phrases designed to cue the appropriate coping strategy. Specifically, in the superior self-aspects condition, participants completed five sentences, all of which began: "I might not be as intelligent as the engineering students but I am…" This phrase prompted respondents to come up with other positive self-aspects. In contrast, participants in the inferior others condition completed five sentences, beginning with: "I might not be as intelligent as the engineering

students but at least I am not as unintelligent as…" This prompt made them think about other groups of people who perform worse than them on the threatened dimension. The effectiveness of this manipulation was confirmed in a separate pretest reported in Appendix C, section C.1.

In the second seemingly "unconnected" study, participants took part in a food tasting task, in which they were given a cup of 80 grams of M&M's and asked to taste and evaluate the candies on several dimensions (e.g., crunchiness, sweetness). Then they completed several filler tasks (e.g., watched a short video and answered questions about it) and were invited to have as many M&M's as they wanted while working on those tasks. At the end of the filler tasks, the lab administrator collected and weighed the remaining grams of M&Ms for each participant. Unbeknownst to respondents, the amount of M&M's consumed during the experiment was used as a measure of self-control (following Ward and Mann 2000).

3.4.2 Analysis and results

One outlier was removed from analysis as its value on the dependent variable was more than 2.5 standard deviations above the mean (Tavassoli and Fitzsimons 2006).

I conducted a one-way ANOVA using the grams of M&M's consumed by each participant as the dependent variable and the coping strategy condition as the between-subjects factor. Results revealed that individuals who used the superior self-aspects strategy consumed a significantly smaller amount of M&Ms (M = 20.13g, SD = 11.48) than those who implemented the inferior others strategy (M = 38.25g, SD = 29.29), $F(1, 41) = 5.25$, $p = .03$.

3.4.3 Discussion

Using more controlled laboratory conditions in which I induced a social identity threat and manipulated coping strategy use, study 1 provides additional evidence for my prediction. In line with the theory and the findings in the field study, the results demonstrate that the inferior others coping strategy leads people to exhibit poorer self-control and consume a greater amount of an indulgent snack than does the superior self-aspects strategy.

3.5 STUDY 2

Past research demonstrates that social identity threats mainly affect those that identify closely with the threatened in-group (Boninger et al. 1995; Ellemers et al., 2002). Consequently, we should observe the predicted effects of the two strategies on self-control only for individuals who identify strongly with the threatened in-group but not for those with weak identification, for whom the social identity threat is not relevant (Maass et al., 2003). I test this proposition in the next two experiments in which I again threatened participants' business student identity but used a more diverse sample with greater variation in individuals' identification with the threatened group. In contrast to study 1 which was conducted only with business students, the samples in the next two studies included college students pursuing degrees in a variety of disciplines and thus the extent to which they identified themselves with the threatened in-group varied. Three additional objectives of studies 2A and 2B were to: (1) provide support for the differential impact of the two coping strategies in a non-eating self-control domain (study 2A); (2) rule out mood as an alternative explanation (studies 2A and 2B); (3) assess the strategies' effectiveness,

showing that they are equally successful at restoring the self after a social identity threat (study 2B).

3.6 STUDY 2A

3.6.1 Method

Study 2A followed a 2 (Coping Strategy: superior self-aspects, inferior others) between-subjects design with participants' in-group identification as a second continuously-measured factor. Participants (n =141; 65% female) were students at a large private university and completed three seemingly unrelated studies; they were paid $10 for a one-hour session.

First, participants rated their identification with the group of business students on a four-item scale (e.g., "I see myself as a business student; Hogg & Hains, 1996) anchored by 1 = "Strongly Disagree" and 7 = "Strongly Agree". These four items were averaged (α = .92) to create a business student identity index. Then participants encountered the identity threat and were directed to use a specific coping strategy (as in study 1). Finally, participants proceeded to the third "unrelated" study, in which they faced a self-control challenging situation. All respondents were asked to read and imagine as vividly as possible the following scenario, adapted from Dholakia, Gopinath, and Bagozzi (2005):

> "Imagine that you have gone to the mall to buy a few pairs of socks. As you are walking through the mall, your eyes fall upon a fashionable and attractive sweater. It happens to be in your size and favorite color. The salesperson tells you that the piece on display is the last one left, and they are unlikely to get more of the sweaters in this particular style in the future. You are trying to decide whether you should stick to your budget and purchase only the socks you need or pamper yourself with the fashionable sweater as well."

The outcome of interest was their likelihood to indulge and purchase the attractive sweater instead of sticking with their budget, measured on a 9-point scale, anchored by 1 = "Definitely will stick to my budget and buy only the pair of socks" and 9 = "Definitely will pamper myself with the fashionable sweater in addition to buying the socks." Finally, to rule out mood as an alternative explanation, I collected four mood measures on a 7-point scale anchored by "Very Unhappy/Very Happy", "In a Bad Mood/In a Good Mood", "Very Negative/Very Positive", and "Very Satisfied/Very Dissatisfied" (reverse-coded). These four measures were averaged ($\alpha = .93$) to create a mood index.

3.6.2 Analysis and results

I excluded nineteen participants from the analysis because they were either engineering students or did not indicate their major. As the manipulation threatened the business student identity while at the same time elevating the engineering student identity, all participants who either majored in engineering or did not indicate their major were excluded. Furthermore, seven participants did not respond to the self-control measure. In all subsequent analyses the coping strategy condition was contrast coded (-1 = inferior others; 1 = superior self-aspects) and participants' business student identity was mean-centered ($M = 3.60$, $SD = 1.80$).

3.6.2.1 Confound checks

The mood index was regressed on participants' business student identity, the coping strategy condition, and their interaction. Results showed no significant interaction of business student identity and coping strategy condition ($p = .65$), suggesting that results are not due to systematically different moods created by the threat or the coping strategy. Similar results were

obtained in study 2B and thus they are not discussed further. Moreover, a separate study in which participants' mood was measured immediately after they implemented the coping strategy also revealed no systematic mood differences between the two strategy conditions (p = .75)[8]. This alleviates potential concerns with the mood measurement in studies 2A and 2B that the mood induced by the strategies use might have dissipated or might have potentially changed by the time participants responded to the mood measures.

3.6.2.2 Likelihood of indulging

I estimated a regression model in which business student identity, the coping strategy condition, and their interaction predicted participants' likelihood to indulge. Results revealed only a significant interaction of the coping strategy and participants' business student identity, b = -.41, $t(112)$ = -3.35, p = .001; neither main effect was significant (both p's > .21). Following Aiken and West (1991), I plotted the values of the regression equation at +1 SD and -1 SD from the mean business student identity (see figure 7).

Probing at various levels of participants' business student identity reveals that for participants with strong in-group identification, the likelihood of indulgence depended on the coping strategy used: individuals who used the superior self-aspects strategy were significantly less likely to indulge than those who utilized the inferior others strategy, b = -.76, $t(112)$ = -2.39, p = .02. In contrast, for participants with weak in-group identification, who did not experience an identity threat, the effect of the strategy condition was also significant but in the reverse direction, b = .72, $t(112)$ = 2.35, p = .02).

[8] More details about this study are available from the author.

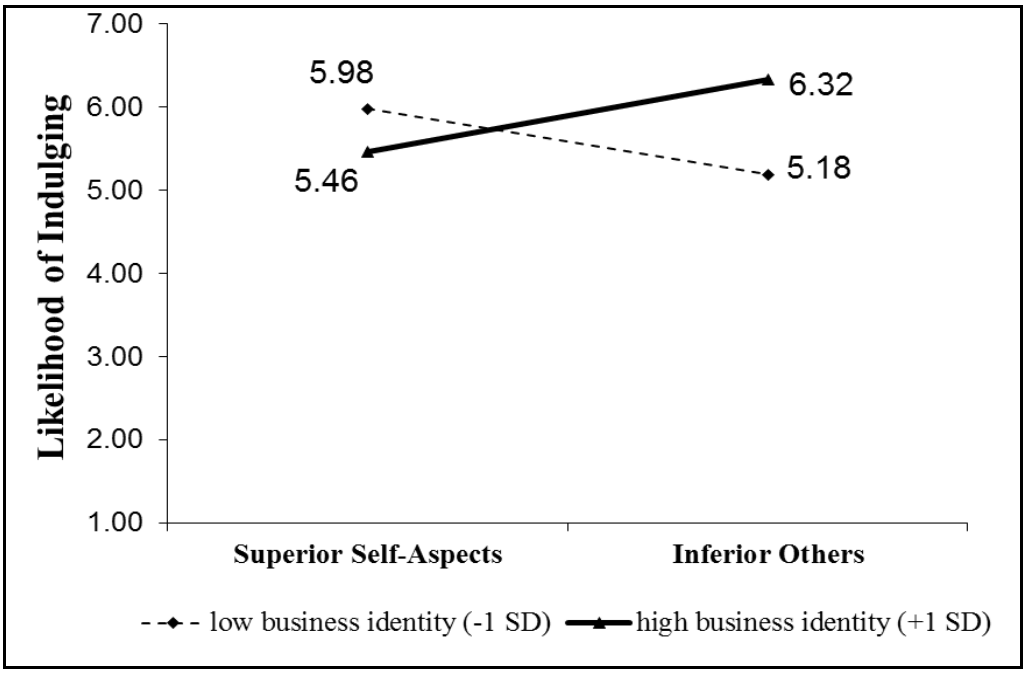


Figure 7. Interaction of Coping Strategy and Business Student Identification on Likelihood of Indulgence

3.6.3 Discussion

Study 2A provides further support for my prediction that the specific ways in which individuals cope with social identity threats differentially undermines self-control. As anticipated, however, the differential impact of the two coping strategies on self-control emerged only for participants who actually experienced a threat (i.e., with high business student identity; Ellemers et al. 2002) but not for those who did not experience a threat (i.e., with low business student identity). Participants who identified strongly with the business students group and were prompted to use the superior self-aspects strategy exhibited better self-control than those who utilized the inferior others strategy.

In contrast, for participants with weak identification with the threatened in-group the inferior others strategy led to better self-control than the superior self-aspects strategy. This

result was unexpected as our research probes the effect of the two coping strategies on self-control after individuals' social identity has been threatened, and past research suggests these "low identifiers" did not experience an identity threat (Ellemers et al. 2002; Schmitt and Branscombe 2001). However, I speculate that this result may be due to the fact that as this group of participants did *not* identify with the business student group, but were forced to think about that group (through the threat and sentence completion prompts), thus they effectively had their out-group knowledge made accessible (i.e., the group of business students was an out-group for those participants). Thus, the inferior others strategy may be *less* taxing because they had been thinking about out-groups through the threat and sentence completion task, yet the superior self strategy required them to come up with aspects about an identity they did not possess, requiring greater self-regulation, and thus resulting in the pattern of effects observed. I explore the effects of activating out-group knowledge as a potential moderator of my theory in studies 4B and 4C.

3.7 STUDY 2B

3.7.1 Method

Study 2B used a 2 (Coping Strategy: superior self-aspects, inferior others) group design with participants' in-group identification as a second continuously-measured factor. In this study I also included a control no threat condition (a "hanging" control condition) to compare the self-control performance of threatened participants using the two strategies with that of non-threatened individuals. Participants (n = 105, 56% female) were college students, who took part in this experiment in exchange for course credit. The procedure was similar to study 2A with the

one exception being that self-control was examined in a different domain. Participants first rated their identification with the group of business students using the same four-item scale (α = .91) as in study 2A. Then participants were presented with the social identity threat and prompted to utilize one of the two coping strategies (as in the previous two experiments). Respondents in the control no threat condition read a neutral article regarding the African elephant taken from *National Geographic* and completed five sentences related to it ("I learned from the article about the African elephant that…"). Finally, all participants responded to the self-control challenging task, in which they imagined that they were at the grocery store and had all of their basics covered, but were looking for some snack food. As a measure of self-control, participants indicated their likelihood of purchasing a healthy but less tasty snack (granola/nutrition bars) which they saw in the store.[9]

This study also incorporated two measures to assess the effectiveness of the coping strategies at repairing self-worth after a threat: performance and social state self-esteem (Heatherton and Polivy 1991), both measured on 7-point scales anchored by 1 = "Strongly Disagree" and 7 = "Strongly Agree". The performance state self-esteem scale includes seven items to measure an individual's self-evaluation of their performance ability (e.g., "I feel confident about my abilities."), averaged (α = .87) to create a performance state self-esteem index. The social state self-esteem scale includes seven items which assess an individual's social confidence (e.g., "I am worried about whether I am regarded as a success or failure"), averaged (α = .88) to form a social state self-esteem index. State self-esteem has been demonstrated to be an appropriate measure of momentary changes in the different components of the self-concept

[9] A separate pretest indicated that granola/nutrition bars are considered to be healthy (M = 5.34 vs. scale midpoint = 4, t(31) = 7.83, $p < .0001$) and virtuous (M = 5.52 vs. scale midpoint = 4, t(30) = 7.96, $p < .0001$) food options. Thus, the use of likelihood of purchasing granola/nutrition bars as a measure of self-control is warranted.

(Heatherton and Polivy 1991). Past research suggests that social identity threats diminish individuals' self-esteem (Branscombe and Wann 1994; Frable et al. 1994), so state self-esteem should capture the effectiveness of the two coping strategies.

3.7.2 Analysis and results

As in study 2A, I excluded from analyses eight participants who were either engineering students or did not indicate their major. This left eighty-four participants in the threat conditions and thirteen participants in the control (no threat) condition. In all analyses the coping strategy condition was contrast coded (-1 = inferior others; 1 = superior self-aspects) and participants' business student identity was mean-centered (M = 3.76, SD = 1.80).

3.7.2.1 Likelihood of purchasing a healthy snack

I regressed participants' likelihood of purchasing the healthy snack on their level of business student identity, the coping strategy condition, and their interaction. Neither main effect was significant (both *p's* > .47). As predicted, however, the interaction of in-group identification and coping strategy was significant, b = .30, $t(80)$ = 2.85, p < .01). I plotted the values of the resulting regression equation at +1 SD and -1 SD from the mean value of the participants' in-group identification (see figure 8).

I examined the high and low levels of participants' business student identity using spotlight analysis (+1 SD and -1 SD; Aiken and West 1991) to identify the pattern of differences on participants' likelihood to purchase the healthy snack. As in study 2A, participants who identified strongly with business students were influenced by the coping strategy used: those participants who used the superior self-aspects coping strategy indicated greater likelihood of

purchasing the healthy snack than participants who utilized the inferior others strategy, b = .55, $t(80) = 2.03$, $p < .03$. Consistent with the results in study 2A, for participants with low in-group identification, the effect of the coping strategy was also significant but in the reverse direction, b = -.53, $t(80) = -2.01$, $p = .05$.

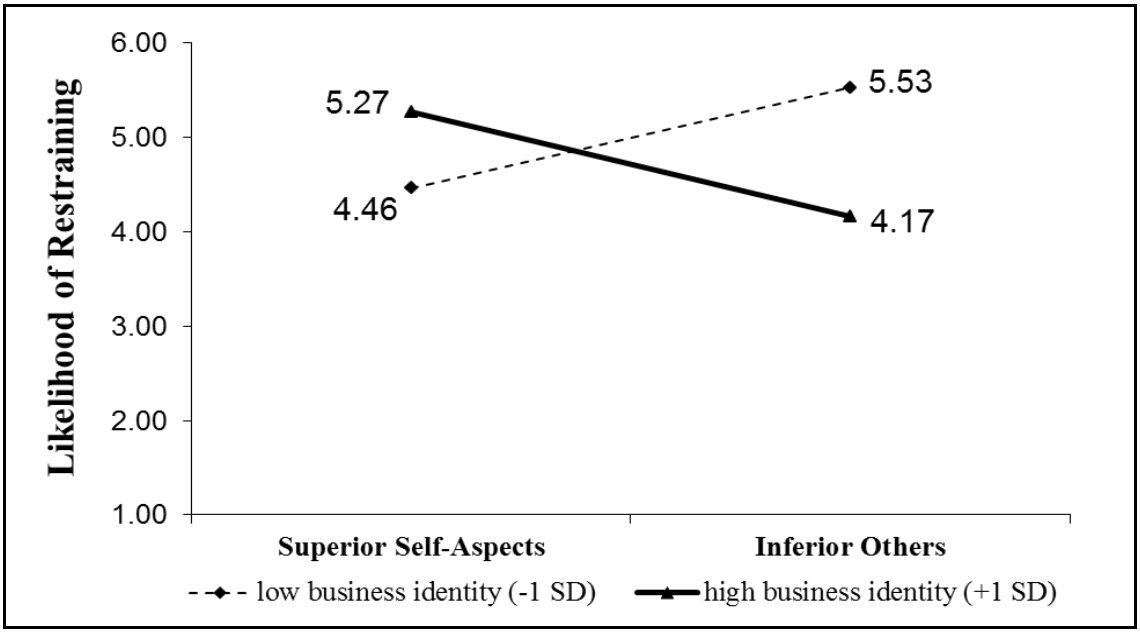


Figure 8. Interaction of Coping Strategy and Business Student Identification on Likelihood of Purchasing a Healthy Snack

Further insights were provided by the control (no threat) condition, in which participants responded to the self-control scenario without having encountered a threat to their social identity. The control no threat condition was treated as a hanging control condition in the analysis. Results revealed that participants who identified strongly with the group of business students and used the inferior others strategy to cope with the social identity threat (M = 4.17) were significantly less likely to purchase the healthy snack than participants in the control no threat condition (M = 5.31), $t(80) = -2.68$, $p < .01$. In contrast, high business student identity individuals, who utilized the superior self-aspects strategy (M = 5.27), exhibited self-control comparable to that of non-threatened participants and were equally likely to purchase the healthy snack (p = .90).

Furthermore, participants with low business student identity (i.e., who did not experience a threat) in the inferior others strategy condition (M = 5.53) had similar self-control to those in the control no threat condition (p = .57). However, low business identity participants in the superior self-aspects condition (M = 4.46) had significantly less self-control than those in the control condition, $t(80) = -2.34$, p = .02).

In sum, the control comparison suggests that while using the inferior others strategy to cope with a social identity threat significantly impaired individuals' self-regulation in subsequent situations, utilizing the superior self-aspects strategy did not inhibit participants' self-control, as seen in their similar degree of restraint as unthreatened individuals. Furthermore, consistent with my earlier results, for individuals with low in-group identification it was the superior self-aspects strategy that was detrimental to self-control rather than the inferior others one as the threat activated out-groups knowledge rather than self-knowledge.

3.7.2.2 Strategy effectiveness

I performed two separate multiple regressions in which participants' social and performance state self-esteem were predicted by their in-group identification, coping strategy, and the interaction of the two variables. The results of the two regressions did not reveal any significant main or interaction effects (all p's > .10), suggesting that the two coping strategies were equally successful in restoring the positive view of the self.[10] Furthermore, the performance and social state self-esteem of high business student identity participants who experienced a

[10] A separate study in which the state self-esteem measures were taken immediately after participants implemented the two strategies also revealed no significant differences in the performance and social state self-esteem of participants in the two strategy condition (both p's >.60). In this study, I also measured participants' state collective self-esteem (adapted from Luhtanen and Crocker 1992); results again revealed no significant differences between the two conditions (p = .92).

threat and coped with it in two distinct ways was similar to that of low business student identity respondents for whom the social identity threat was not relevant. These results suggest that the two strategies are equally effective in restoring the self-worth of the threatened participants to the level of their unthreatened counterparts.

3.7.3 Discussion

Study 2B replicates the earlier findings, but in a different self-control domain. The results again show that the impact of the two coping strategies on self-control varied significantly for participants who identified strongly with the threatened group and thus actually experienced a social identity threat. Specifically, participants with strong in-group identification who were prompted to use the inferior others strategy after encountering a social identity threat were significantly less likely to purchase a healthy but less tasty snack than those who used the superior self-aspects strategy.

Furthermore, study 2B demonstrated that only the inferior others strategy impaired subsequent self-regulation: the self-control exhibited by high business student identity participants assigned to the inferior others strategy condition was significantly lower than the self-control of non-threatened participants. However, there were no significant differences in the self-regulatory patterns of high business student identity individuals who used the superior self-aspects strategy and control non-threatened respondents. Finally, the results of study 2B show that the two coping strategies were equally effective for coping with social identity threats, as evidenced by participants' similar performance and social state self-esteem in the two strategy conditions, and their similarity to the unthreatened low business student identity group. This finding further emphasizes the importance of the different negative impact of the two coping

strategies on people's self-control: as both strategies are equally successful at restoring self-worth, implementing the superior self-aspects appears to be the better option since it helps people preserve their limited self-regulatory resources.

The purpose of study 3 was to examine whether the same effects of the two coping strategies on self-control would emerge when: (1) the social identity threat is embedded in an advertising stimulus; (2) individuals are subtly cued by the advertisement text to use one of the two strategies as a way to cope with the presented threat; and (3) the strategy execution is subtle (i.e., without explicit writing of responses to the threat). If the effects hold under these conditions, this would reinforce the practical implications of my findings—demonstrating that each coping strategy can be easily prompted and implemented.

3.8 STUDY 3

3.8.1 Method

Study 3 used a 2 (Coping Strategy: superior self-aspects, inferior others) group design with participants' in-group identification as a second continuously-measured factor. Participants (n = 50, 39% female) were English-speaking college students, who took part in this experiment in exchange for course credit. Respondents completed two ostensibly unrelated tasks. First, participants rated their identification with NFL fans on the same four-item scale as in studies 2A and 2B ($\alpha = .95$). Respondents were then randomly assigned to view one of two advertisements. Both advertisements contained the social identity threat: "People say football fans are more obnoxious, loud, and annoying than baseball fans." Furthermore, each advertisement also cued

the use of one of the two coping strategies. The text of the superior self-aspects strategy ad read: "But c'mon! We know that they are plenty of positive sides to football fans too…Just think of a few of those: 1… 2… 3…"; while the text of the inferior other strategy ad was as follows: "But c'mon! We know that they are plenty of fans that are more crude than you…Just think of a few of those: 1… 2… 3…" The two advertisements did not differ in any other aspect (see Appendix D). To be consistent with the cover story, after being exposed to the ads, participants rated them on several dimensions (e.g., attractiveness, persuasiveness).

As part of a subsequent "unrelated" task participants imagined that they would receive a snack for their participation and indicate how much that they would like to eat each item on a list of snacks on a 7-point scale anchored by 1 = "Not At All", and 7 = "Very Much So". The list of snacks included both unhealthy (e.g., potato chips) and healthy (e.g., apple) options (Laran 2010). Participants also imagined that they had to choose one snack and indicated their choice.

3.8.2 Analysis and results

Three participants were excluded from the analysis because they were not familiar with American football (i.e., NFL). In all analyses, the coping strategy/ad condition was contrast coded (-1 = inferior others; 1 = superior self-aspects) and participants' strength of identification with the group of NFL fans was mean-centered (M = 4.85, SD = 1.76).

3.8.2.1 Appeal of unhealthy snacks

The main dependent variable was the appeal of the unhealthy snacks which was created by averaging the appeal ratings of all unhealthy snacks (α = .87). The appeal of the unhealthy snacks was then regressed on participants' NFL fan identity, the coping strategy/ad condition,

and their interaction. Results revealed a significant main effect of strength of NFL fan identity, *b* = .28, *t*(43) = 2.24, *p* = .03, which was qualified by a significant interaction of participants' NFL fan identity and the coping strategy/ad condition, *b* = -.33, *t*(43) = -2.64, *p* = .01. The values of the regression equation were plotted at +1 SD, the mean value, and -1 SD from the mean of participants' in-group identification, shown in figure 9.

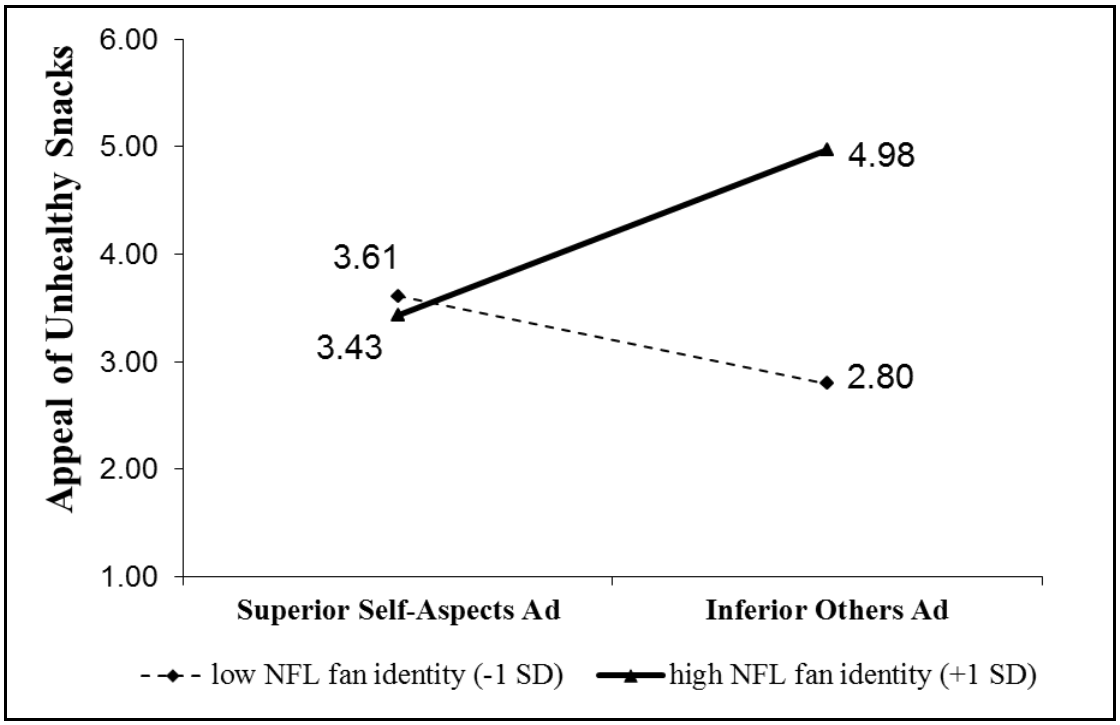


Figure 9. Interaction of Coping Advertisement and NFL Fan Identity on Appeal of Unhealthy Snacks

Using spotlight analysis, I probed the pattern of differences on the appeal of the unhealthy snacks at the high and low levels of individuals' NFL fan identity (+1 SD and -1 SD). As in studies 2A and 2B, participants who strongly identified with the group "NFL fans" were influenced by the coping strategy used: participants who were exposed to the superior self-aspects strategy advertisement found the unhealthy snacks less appealing than participants who saw the inferior others strategy ad, *b* = -.77, *t*(43) = -2.69, *p* = .01. In contrast, those participants who only weakly identified with NFL fans had no difference in their self-control based on the

type of strategy in the ad (p = .22). Similar results were obtained when we used the ratio of the appeal of the unhealthy snacks to the appeal of all snacks or the ratio of the appeal of the unhealthy snacks to the appeal of the healthy snacks as the dependent variables.

3.8.2.2 Snack selection

A logistic regression was also run on participants' snack choice (coded as 1 = healthy snack; 0 = unhealthy snack) predicted by participants' NFL fan identity, the coping strategy/ad condition, and their interaction. Results showed a significant interaction of strength of in-group identification and coping strategy, b = .44, Wald χ^2 (1) = 4.03, p = .04. Follow-up analyses revealed that for participants who identify strongly with the NFL fan identity, those who viewed the superior self-aspects strategy ad were 2.4 times more likely to select a healthy snack than participants who were cued with the inferior others strategy, b = .88, $exp(b)$ = 2.41, Wald χ^2 (1) = 3.43, p = .06. There was no difference in the likelihood of choosing a healthy snack between the two strategies for participants with weak NFL fan identity (p = .23).

3.8.3 Discussion

The results of study 3 replicate the previous findings and provide convergent evidence for my theoretical propositions. However, in contrast to the previous experiments which used relatively strong manipulations of the social identity threat and coping strategy, this study embedded both the threat and strategies in adverting stimuli, demonstrating that the proposed effects occur even in more practical situations. Specifically, the results show that participants who were exposed to the inferior others strategy ad were significantly more tempted by unhealthy snacks and made unhealthier snack choices than those who were exposed to the

superior self-aspects ad. In sum, this study highlights that even unobtrusive strategy prompts lead to the same differences on subsequent self-control, thus suggesting that the findings can be used by practitioners for designing interventions to improve self-control in identity threatening situations. In addition, these findings can benefit marketers who may want to tailor their advertisements in a way that prompts consumers to indulge or exercise self-control, influencing sales of unhealthy or healthy products. These possibilities are further discussed in the General Discussion.

3.9 STUDY 4

Thus far, support for the main proposition that the inferior others coping strategy leads to poorer self-regulation than does the superior self-aspects strategy has emerged. However, there is yet no evidence of the process underlying these effects. This issue is addressed in the next three experiments: study 4A demonstrates that a social identity threat increases the accessibility of the self, while studies 4B and 4C moderate the effects of the two coping strategies on self-control and show that accessibility of out-group knowledge is driving the detrimental effects of the inferior others strategy.

3.10 STUDY 4A

3.10.1 Method

Study 4A utilized a 2 group (threat vs. control) design and was conducted only with individuals who belonged to the threatened in-group. Participants (n = 82, 59% female) were students pursuing a business degree at a large university and completed the study online in exchange for course credit. Participants in the threat condition were asked to imagine a scenario which contained the social identity threat manipulation (same threat to the business student identity as in previous studies), while respondents in the control condition read a neutral article from *National Geographic*. Then all participants indicated their agreement with seven items, designed to assess the amount of self-knowledge activated on a 7-point scale with 1 = "Strongly Disagree" and 7 = "Strongly Agree" as its anchors (e.g., "While imagining the scenario (reading the article), I thought primarily about myself and my own traits and abilities.", "The traits that describe "who I am" are vivid in my mind now."). The seven items were averaged ($\alpha = .83$) to form an activation of self index. Respondents also indicated the extent to which their self was activated using a different, more visual measure in which different degrees of the self activation were signified by small man figures with varying degrees of highlighting (see Appendix E).

Finally, since participants completed this study at home, I included also a measure designed to identify individuals who did not read the instructions carefully (Oppenheimer, Meyvis, and Davidenko 2009; as used by Nelson and Simmons 2009).

3.10.2 Analysis and results

I excluded 13 participants who failed the instructional manipulation check (Oppenheimer, Meyvis, and Davidenko 2009). One participant provided partial responses to the self-activation measures; where data are available, they are included. Two one-way ANOVAs conducted on the two activation of self measures (scale and visual) as a function of the experimental condition revealed that participants in the threat condition (M_{scale} = 5.11, SD = .91; M_{visual} = 4.44, SD = .69) had their self activated to a greater extent than those in the control condition (M_{scale} = 3.37, SD = .94; M_{visual} = 3.88, SD = 1.05), $F(1, 66) = 60.30$, $p < .0001$ and $F(1, 67) = 7.04$, $p < .01$ respectively.

3.10.3 Discussion

Study 4A shows that the experience of a social identity threat leads to an activation of individuals' self-knowledge and provides support for the first link in the proposed process. With the link from identity threats to self-knowledge activation established, studies 4B and 4C seek to understand whether activating others-knowledge will reduce the regulatory costs of the inferior others strategy.

Studies 4B and 4C provide evidence for the proposed mechanism underlying the different impacts of the two coping strategies on self-control. I predict that the shift in thoughts from the self to others (from accessible self-knowledge to inaccessible out-groups knowledge) required for the implementation of the inferior others strategy consumes self-regulatory resources, which in turn results in self-control failures.

In order to test the proposed mechanism, studies 4B and 4C manipulate the accessibility of out-groups-knowledge in two different ways. I predict that when the accessibility of out-groups is increased, the implementation of the inferior others strategy will become easier and this will reduce its detrimental impact on self-control. Specifically, I predict that when the accessibility of out-groups-related concepts is low, the findings from the previous studies would replicate: we should see poorer self-control after the use of the inferior others strategy than the superior self-aspects. However, when the accessibility of out-groups knowledge is high, there should be no differences on self-control between the two coping strategies.

3.11 STUDY 4B

3.11.1 Method

Study 4B utilized a 2 (Coping Strategy: superior self-aspects, inferior others) x 2 (Accessibility of Out-Groups Knowledge: high, low) between-subjects design. As in study 4A, only members of the business student group were used. Participants (n = 55, 63% female), were business students at a large public university and completed two ostensibly unrelated studies for course credit. Participants both encountered the identity threat and were directed to use a specific strategy in the first study, while the second "unrelated" study incorporated the self-control measures (same self-control decision as in study 2A). Importantly, prior to the social identity threat, participants in the high out-groups knowledge accessibility condition wrote about groups to which they do not belong (manipulation instructions: "In the space provided below please list any social groups which you are not part of. For example, if you are a female, you could list

"fraternity" or "football players", because you are not part of those groups. Make sure to list only those groups which you do not consider yourself to be part of. List as many groups as you can come up with."). I expected that requiring participants to think and write about various out-groups would increase the accessibility of out-groups-related knowledge structures, and would make it easier to implement the inferior others strategy, thus reducing its detrimental impact on self-control.

3.11.2 Analysis and results

I ran a two-way ANOVA on participants' likelihood to indulge using the coping strategy and accessibility of out-groups knowledge conditions as the two between-subjects factors. While the two main effects were not significant (both *p's* > .60), a significant interaction of coping strategy and accessibility of out-groups knowledge emerged, $F(1, 51) = 5.45$, $p = .02$ (see figure 10). When out-group related concepts were not accessible, previous results were replicated: participants using the superior self-aspects strategy ($M = 4.93$, $SD = 2.46$) were less likely to indulge than those using the inferior others strategy ($M = 6.69$, $SD = 1.84$), $F(1, 51) = 3.94$, $p = .05$. However, when accessibility of out-groups knowledge was increased, the inferior others strategy was no longer more detrimental to participants' self-control: there were no significant differences in likelihood to indulge between the superior self-aspects ($M = 6.14$, $SD = 2.07$) and inferior others ($M = 5.00$, $SD = 2.72$) conditions ($p = .20$). Furthermore, planned comparisons also revealed that among participants using the inferior others strategy, those in the high out-groups knowledge accessibility condition were less likely to indulge than those in the low accessibility condition, $F(1, 51) = 3.63$, $p = .06$. Finally, for participants in the superior self-

aspects condition there was no significant difference in the likelihood to indulge based on the accessibility of out-groups-related concepts (p = .17).

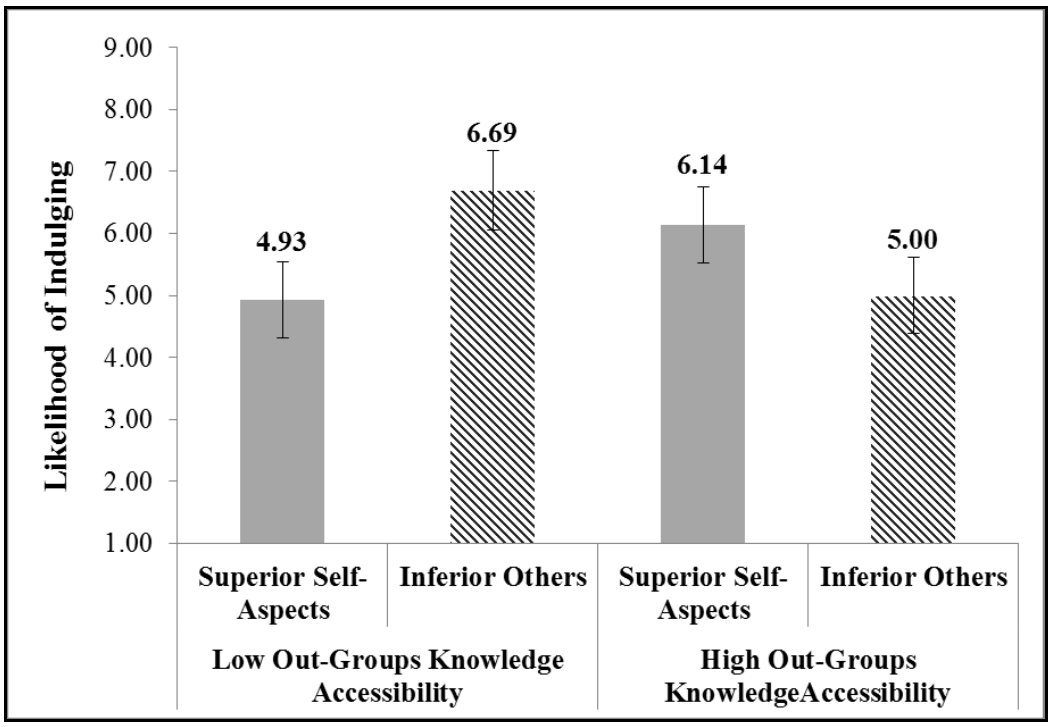


Figure 10. Interaction of Coping Strategy and Accessibility of Out-Groups Knowledge on Likelihood of Indulgence

3.11.3 Discussion

Study 4B provides evidence for the proposed mechanism underlying the effects of the two coping strategies on self-control. When the accessibility of out-groups knowledge was low, my previous results replicated: individuals using the superior self-aspects strategy exhibited lower likelihood of indulgence in a subsequent decision than those who relied on the inferior others strategy. However, increasing the accessibility of out-groups-related knowledge structures significantly diminished the detrimental impact of the inferior others strategy on self-control. Thus, in the high accessibility of others condition, respondents in the two coping strategy conditions did not differ in the amount of self-control exerted in the following spending decision.

The final experiment manipulates the accessibility of the self- and others-related concepts differently, providing additional evidence for the proposed process.

3.12 STUDY 4C

3.12.1 Method

Study 4C used a 2 (Coping Strategy: superior self-aspects, inferior others) x 2 (Accessibility: self, others) between-subjects design. Participants (n = 73, 62% female) were business students at a large public university and completed the study in exchange for course credit. The procedure was similar to the procedure used in study 4B. The only exception was that, prior to exposing participants to the social identity threat, I manipulated the accessibility of the self and others by adapting a procedure from Gardner et al. (1999). Specifically, participants in the self-accessibility condition were asked to read a short paragraph and count the number of first-person pronouns (e.g., "I", "me", "my", "myself"), while those in the others-accessibility condition read a similar paragraph and counted the number of other-people pronouns (e.g., "they", "them", "their", "themselves"). The two paragraphs were identical except for the pronouns used. This manipulation was pretested in a separate study (see Appendix C, section C.2). Finally, participants were exposed to the social identity threat, the strategy manipulation, and the self-control scenario (as in study 4B).

3.12.2 Analysis and results

I conducted a two-way ANOVA on participants' likelihood to indulge using the accessibility and coping strategy conditions as the between-subjects factors. While neither of the main effects were significant (both *p's* > .37), a significant interaction of the two factors emerged, F(1, 69) = 6.87, $p = .01$ (see figure 11). Follow-up analyses revealed that when the self was made accessible prior to the threat, results replicated the previous findings such that participants who used the inferior others strategy ($M_{inferior\ others} = 7.20$, $SD = 1.70$) were more likely to indulge than those who used the superior self-aspects one ($M_{superior\ self} = 5.29$, $SD = 2.75$), $F(1, 69) = 5.55$, $p = .02$. However, when others-related concepts were made accessible, there was no difference in the likelihood to indulge of participants in the two strategy conditions ($M_{superior\ self} = 6.27$, $SD = 1.83$ vs. $M_{inferior\ others} = 5.18$, $SD = 2.75$, $p = .18$). Finally, the negative impact of the inferior others strategy on self-control was significantly reduced in the others-accessibility condition relative to the self-accessibility condition, $F(1, 69) = 6.28$, $p = .01$; there was no difference in the self-control of participants using the superior self-aspects strategy between the two accessibility conditions ($p = .23$).

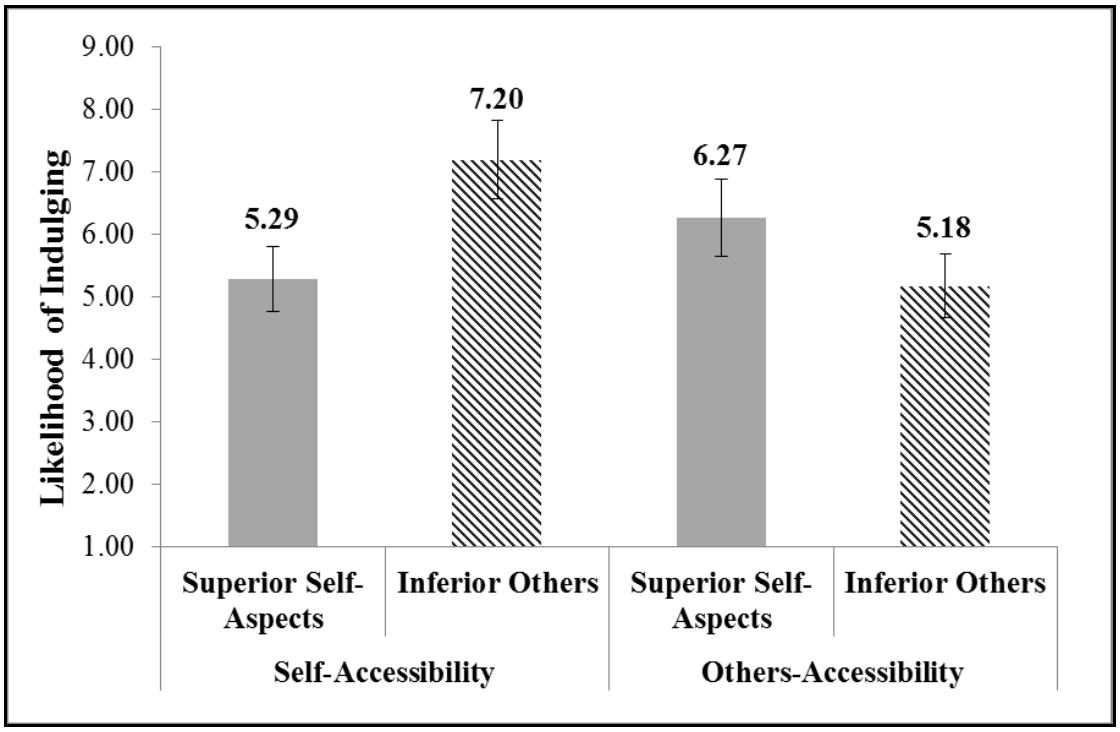


Figure 11. Interaction of Self- vs. Others-Accessibility and Coping Strategy on Likelihood of Indulgence

3.12.3 Discussion

Using a different manipulation of accessibility of self- versus others-related concepts, study 4C provides additional evidence for the process through which the two coping strategies impact differently individuals' self-control. In line with my theory which proposed that the superior self-aspects strategy leads to better self-control because it retains thoughts on the active self, the results showed that when the self was made more accessible, the previous findings replicated and the superior self-aspects strategy led participants to indulge less than the inferior others strategy. However, as in study 4B, increasing the accessibility of others-related concepts reduced the detrimental impact of the inferior others strategy, leading individuals using the two coping strategies to demonstrate equally successful self-control.

3.13 GENERAL DISCUSSION

Previous research on social identity threats has primarily examined their effects on various threat-related outcomes, such as performance decrements following a stereotype threat (e.g., Schmader 2002). Relatively less work examines how social identity threats impact behavior in threat-unrelated domains, but the few exceptions have shown depletion of self-regulatory resources following a threat, evidenced by individuals consuming fattier foods (Cornil and Chandon 2013) or behaving aggressively (Inzlicht and Kang 2010). In all of these studies, however, the methods individuals use to cope with threats have been unexamined; either the individual copes with the threat or does not, and this mediating process has been left as a "black box." The research reported here unpacks the coping process and compares two social creativity strategies for coping with social identity threats, examining their impact on individuals' self-control in threat-unrelated domains. One field study and seven experiments demonstrate that the use of the superior self-aspects strategy is less detrimental to self-control than the inferior others strategy. These effects hold using both scenario-based measures of self-control (studies 2A, 2B, 3, 4B, and 4C) and real food consumption (field study and study 1) in two important domains: eating and spending. Most importantly, the effects are robust even in real world settings (a café), in situations involving naturally occurring social identity threats (loss of the favorite NFL team), and in conditions in which both the social identity threat and cues prompting the strategies use are subtle (advertisements). Furthermore, the differential cost of the two coping strategies on self-control is noteworthy given that they are equally successful at restoring positive views of the self. Finally, in the last three studies we examine the process underlying these differences: we show that experiencing a social identity threat increases the accessibility of self-knowledge; thus, the inferior others strategy impedes self-control because it requires one to shift thoughts from

accessible self-concepts to inaccessible out-groups-related concepts, which taxes individuals' self-regulatory resources.

It is important to note that the findings that the superior self-aspects strategy leads to better self-control than the inferior others strategy cannot be explained by extant research linking self-affirmation and self-control. Self-affirmation comprises cognitive and behavioral events that enhance the "perceived integrity of the self, its overall adaptive and moral adequacy" (Steele 1988, p. 291). Research on self-affirmation shows that it replenishes previously depleted self-regulation resources and reduces the likelihood of subsequent self-control lapses (Schmeichel and Vohs 2009). However, since both coping strategies constitute acts of self-affirmation, as both improve self-worth equally (Sherman and Cohen, 2006; Fein and Spencer 1997), the differential impact of the two strategies on self-control cannot be explained by self-affirmation.

3.13.1 Theoretical contributions

Taken together, this research makes a number of contributions to the social identity and self-regulation literatures. Table 1 summarizes prior research on the topic of coping with social identity threats and its downstream effects on behavior.[11]

[11] This table does not provide an exhaustive list of all papers on the topics but rather aims to provide a succinct overview of prior research which has studied coping with social identity threats and its consequences on consumer behavior.

Table 1. Overview of Prior Research on Coping with Social Identity Threats

Paper	Type of Threat	Coping Strategy	Consequences in Threat-Relevant Domain	Consequences in Threat-Irrelevant Domain	Type of DV	
					Scale	Real Behavior
Branscombe and Wann (1994)	group value threat	out-group derogation	X			
Carr and Steele (2011)	stereotype threat/group value threat	*unspecified*		X		X
Cheryan and Monin (2005)	prototypicality threat	identity assertion	X		X	
Maas et al. (2003)	legitimacy, group value, distinctiveness, and prototypicality threats	out-group derogation	X		X	X
White and Argo (2009); White, Argo, and Sengupta (2012)	group value threat	(dis)associative responses	X		X	
Schmader (2002)	stereotype threat/group value threat	*unspecified*	X			X
Schmitt and Branscombe (2001)	prototypicality threat	evaluations of in-group members	X			X
Inzlicht and Kang (2010)	group value threat	*unspecified*		X	X	X
Inzlicht, McKay, and Aronson (2006)	stigma/stereotype threat	*unspecified*		X	X	X
Cornil and Chandon (2013)	group value threat	*unspecified*		X	X	X
The present research	**group value threat**	**Superior self-aspects; Inferior others**		**X**	**X**	**X**

A review of the prior literature reveals some important trends. First, most of the research on the topic has focused on understanding the consequences of social identity threats in *threat-relevant* domains. For example, researchers studying the effects of stereotype threats primarily investigate individuals' performance in the stereotyped domains (i.e., how a stereotype threat regarding women's intelligence affects their performance on a math test; Schmader 2002). The few exceptions to this trend have examined the spillover effects of coping with social identity threats in *threat-irrelevant* domains, linking identity threats to increased loss-aversion and risk aversion (Carr and Steele 2011) and diminished self-control (Inzlicht and colleagues, 2006; 2010; Cornill and Chandon 2013).

Second, most of the extant research on the topic of social identity threats has studied only one coping strategy *in isolation*, which has, to a certain degree, limited our understanding of the differences and similarities among the strategies, as well as potential advantages and disadvantages of certain strategies over others. In addition, in some cases even the nature of the coping strategy is not identified by the authors and is rather left unknown. This is exactly the case in the research linking social identity threats and self-control (e.g., Cornil and Chandon 2013; Inzlicht and Kang 2010) which has focused on demonstrating the detrimental consequences of threat coping in different self-control domains without considering the different strategies that might be used in the coping process. Finally, the superior self aspects and inferior others strategies, which are the focus of the present work, have been largely unexamined since they were first discussed by Tajfel and Turner (1986).

Therefore, Table 1 highlights that this research makes the following four key contributions. First, I contribute to the relatively limited research that examines the consequences of coping with social identity threats in *threat-irrelevant* domains by bridging the social identity

and self-control literatures. Second, I extend the prior work linking social identity threats with impaired self-control (Cornil and Chandon 2013; Inzlicht and Kang 2010) by illuminating the "black box" between the social identity threat experience and self-control and examining two specific coping strategies and their self-regulatory costs. Specifically, I show that the negative impact of coping with social identity threats on self-control depends on the specific coping strategy that individuals use and also elucidate the process through which these differences occur. In my work, I demonstrate that while the inferior others strategy hindered participants' self-control in a subsequent task, this was not the case with the implementation of the superior self-aspects strategy. This suggests that long-term goal-directed behaviors do not necessarily have to be impeded by coping with social identity threats, but that individuals should be careful in the selection of the specific strategy they use to deal with a threat to the self.

Third, I bring attention to potential differences that could exist among the various strategies for coping with social identity threats. As seen in Table 1, most of the research on social identity threats has studied only one coping strategy in isolation, which has limited our understanding of the positive and negative consequences of their use. Further, in some cases the coping strategy is not even identified by the authors and is rather left as a uni-dimensional, unspecified, construct (e.g., Cornil and Chandon 2013; Inzlicht and Kang 2010). The present work is a first step toward addressing this gap by studying *two* different coping strategies, and examining their differences and similarities with the hope to offer recommendations as to which is more beneficial for individuals. I note that the two strategies might be similar in their ability to successfully repair the self after a social identity threat, but are substantially different in their impact on self-control. Thus, the broader contribution of this research is that it highlights that the social identity literature can be enriched by more inquires into the question of how the various

coping strategies differ. Finally, I contribute to the social identity literature by studying the two social creativity strategies - the superior self aspects and inferior others strategies, which are the focus of the present work, have been largely not researched since their introduction by Tajfel and Turner (1986).

3.13.2 Practical implications

Given that the demonstrated effects are robust in real world settings (i.e., in actual consumption decisions, with naturally occurring social identity threats, and when the strategies are subtly cued and executed), the current research has significant practical implications. Self-control is essential for people's success in life (Mischel and Ayduk 2004). Past research has linked high self-control to a variety of positive outcomes including but not limited to better interpersonal functioning and healthier relationships, better work and school performance, and greater psychological well-being (Tangney, Baumeister, and Boone 2004; deRidder et al. 2012). Furthermore, researchers have also suggested that poor self-control is at the root of many of the most alarming problems in the society, such as obesity, consumer debt, inadequate savings for retirement, smoking, alcohol and drug addiction, and criminality (e.g., Baumeister and Heatherton 1996; Baumeister, Vohs, and Tice 2007; deRidder et al. 2012; Gottfredson and Hirschi 1990; Patton, Stanford, and Barratt 1995; Vohs and Faber 2007).

Thus, while my findings have implications for general well-being because of the vast range of important benefits of self-control in different aspects of people's lives, I believe that this work will be particularly beneficial to both individuals struggling with various self-control problems, such as obesity and credit card debt, as well as practitioners who wish to design effective interventions for overcoming such problems. For instance, it is possible that one of the

reasons why many people often fail at their attempts to start eating healthily or to pay off high interest rate credit cards is because they often encounter identity threats and cope with them in a sub-optimal way, which inevitably sabotages their self-control progress. Since such identity threats are common in people's lives, it is essential for them to know not only that coping with such experiences can undermine their self-regulation, but also that there are ways in which they can repair the self without incurring a cost on their self-control efforts.

Furthermore, practitioners providing assistance to individuals dealing with various self-control problems should be aware that these individuals may be particularly vulnerable to threats to their already "shaken" self and that those threats can inadvertently subvert the progress made by their patients. Therefore, practitioners might increase the success of their interventions if they consider teaching their patients the effective ways in which they can cope with identity threats without undermining their self-control. Various programs (e.g., workplace and school dieting programs, commercial weight programs such as Weight Watchers, smoking cessation groups, and consumer debt management and support groups) designed to assist individuals with overcoming important self-control problems might also benefit from this advice, which would allow them to improve their success rates.

Finally, given that the effects occurred even when the strategies use was subtly cued by advertisements, I believe that marketers might benefit from these findings as well. For instance, marketers of both healthy and unhealthy foods may want to target consumers with specific social identities (e.g., sports fans, stay-at-home moms) and tailor their advertising messages in a way that prompts them to indulge or exercise self-control and thus increase the sales of their products. Moreover, marketers of sports team apparel and fan gear might be able to induce consumers to splurge on expensive items by embedding a social identity threat in marketing communication

materials along with cues to use the inferior others strategy as a way to cope with the presented threat.

3.13.3 Future research

This research also offers some interesting directions for future research. This paper focused on the effect of the two coping strategies on self-control after the experience of one particular type of social identity threat, namely a threat to group value. However, Branscombe et al. (1999) suggest that individuals' social identity can be threatened in a variety of ways and offer a taxonomy that distinguishes between four basic types of threats: threat to group value (information suggesting that the in-group is valued less or performs worse than an out-group), category threat (people feel threatened because they are categorized in a particular group against their will), acceptance or prototypicality threat (information challenging an individual's status as a prototypical group member), and distinctiveness threat (information that questions the distinctiveness of the in-group from an out-group). Of these four types of threats, the threat to group value is considered to be the most central within social identity theory (Giguére and Lalonde 2009). However, it would be insightful to examine whether the theory presented here would hold also for experiences of the other three threats. In particular, the proposed mechanism of accessibility may hold across all forms of self-threats, however, what *concepts become accessible* following the threat may change. For instance, one could predict that category threat—where individuals are mis-categorized into an undesirable group—might make out-groups more accessible, possibly reversing the pattern of effects seen in our work. Considering what self-, other-, and group concepts are made accessible through each threat, and how these concepts influence the coping process and self-control may be a fruitful area for future research.

Furthermore, in the present research I assume that individuals prioritize coping with social identity threats before any other self-control tasks. In other words, people choose to first repair the self due to the aversive psychological consequences associated with social identity threats and then use the remaining self-regulatory resources for subsequent self-control tasks. However, there may be some conditions where individuals forgo restoring their positive social identities in order to save their limited self-regulatory resources for future use. Given past research which shows that people do in fact engage in such strategic use of self-control and prioritize certain self-control uses over others (Muraven, Shmueli, and Burkley 2006), future research could examine how individuals choose to divide their limited self-regulatory resources between restoring the self after a threat and other self-control challenging tasks, as well as look further into the conditions which could give priority to one over the other.

3.13.4 Conclusion

The present research examined two social creativity strategies for coping with social identity threats – emphasizing superior self-aspects or thinking of inferior others – and compared their impact on self-control. The results revealed that using the inferior others strategy leads to poorer self-control than does the superior self-aspects strategy, as individuals must change their focus from accessible self-knowledge to relatively inaccessible out-group knowledge. While past research had demonstrated that coping with social identity threats has a detrimental impact on individuals' self-regulation, this work emphasizes that there are significant differences in the self-regulatory costs of the various coping strategies and highlights that the superior self-aspects strategy allows people to restore the positive view of the self without significantly sabotaging their subsequent self-control success.

4.0 ESSAY 3: *SHOULD* BIRDS OF A FEATHER FLOCK TOGETHER? UNDERSTANDING SELF-CONTROL DECISIONS IN DYADS

Despite the fact that consumers' ability to exercise self-control is recognized as partially socially-determined (Battaglini, Bénabou, and Tirole 2005; Heatherton and Vohs 1998; Pachucki, Jacques, and Christakis 2011), the bulk of research in consumer behavior focuses on independent behaviors. For example, a single individual might be asked to allocate money between repaying debt and spending on immediate consumption (Haws, Bearden, and Nenkov 2011), choose menu items (Wilcox, Kramer, and Sen 2011), or determine how they will spend their time (Hung and Mukhopadhyay 2012). To the extent that individuals exhibit indulgence in these choices, we say that they possess low self-control, and with it, may fall prey to a wide range of pathologies – debt, obesity, or poor job performance (Tangney, Baumeister, and Boone 2004).

In reality, however, many decisions involving self-regulation are made in concert with others. That is, self-control is essentially a social enterprise (Finkel et al. 2006; Fitzsimons et al. 2005; Heatherton and Vohs 1998; Pachucki et al. 2011, VanDellen and Hoyle 2010). As such, one stream of research has focused on tasks performed *independently* that are influenced by the mere presence (Ackerman et al. 2009; Herman, Roth, and Polivy 2003; McFerran et al. 2010; VanDellen and Hoyle 2010) or thoughts of others (Martjin et al. 2007). However, little work considers decisions that are actively made as a collaborative process between two individuals.

For example, a pair of friends may decide together whether to study for an upcoming exam or go to a movie. Similarly, a pair of workplace colleagues may decide together whether to order a healthy lunch from the vegan restaurant or opt for the wings and pizza combo. Furthermore, a couple may go grocery shopping together, create a monthly household budget together, or decide jointly whether to indulge on a luxurious vacation beyond their budget. We call such decisions *joint* self-control decisions: decisions in which the two partners in a couple provide input into the decision-making process, ultimately reach *one* decision, and experience the outcomes related to their decision together. Such joint self-control decisions fall under the category of "joint decision, joint consumption" in the typology proposed by Gorlin and Dhar (2012) or conjunctive tasks (i.e., tasks on which all members must succeed for the dyad to be successful) in the typology of Steiner (1966). Interestingly, little research has focused on how dyads perform on such decisions.

To address this gap in the literature, I examine the joint self-control decisions of three dyad types, formed on the basis of different combinations of partners' trait self-control levels. Specifically, I study dyads containing two low self-control individuals (homogeneous low self-control), dyads composed of one low self-control and one high self-control individual (mixed self-control), and dyads containing two high self-control partners (homogeneous high self-control). Seven studies demonstrate that homogeneous high self-control dyads display more restraint in their joint self-control decisions than both homogeneous low self-control and mixed dyads. Importantly, though, despite the presence of a higher self-control partner, the mixed dyad's joint decisions are no less indulgent than those of the homogeneous low self-control pair. Building on Finkel and Campbell (2001), I argue that this pattern exists because higher self-control individuals have higher ability and stronger motivation to engage in prorelationship

behaviors than do lower self-control individuals. Thus, in a mixed dyad, higher self-control partners resolve conflict with a lower self-control partner's preferences by assenting to their indulgent tendencies. Supporting this account, I show that increasing (decreasing) the prorelationship motivation of low self-control (high self-control) individuals in mixed dyads improves the mixed dyads' joint self-control.

The present work contributes novel theoretical insights to prior research. First, though past research has studied dyadic decision-making in a variety of contexts, including but not limited to negotiations (Ten Velden, Beersma, and De Dreu 2010), organizational dyadic relationships (Basu and Green 1995), and joint marital decisions (Corfman and Lehmann 1987; Ferber and Lee 1974; Park 1982; Rosen and Grandbois 1983; Su, Fern, and Ye 2003), to my knowledge, little work examines how dyads navigate self-control challenges together. Therefore, the present work responds to Fitzsimons and Finkel's recent call (2010) for inquiries into the interplay of self's and others' self-regulation goals. Second, past research suggests that high self-control has generally positive outcomes, such as better job and academic performance, healthier interpersonal relationships, and greater physiological and psychological well-being (de Ridder et al. 2012; Tangney et al. 2004). My work suggests that high self-control might be a double-edged sword in dyadic decisions, since the tendency to engage in prorelationship behaviors may in fact threaten long-term financial and health outcomes.

Finally, recent work on relationship quality and marital well-being (Rick, Small, and Finkel 2011; Vohs, Finkenauer. and Baumeister 2011) has focused on the effect of partners' self-control levels or spending tendencies on relationship quality outcomes. I extend this work by examining how the different combinations of partners' self-control scores affect their success at

joint self-regulation tasks (e.g., joint spending, saving, and food decisions), which may have far-reaching consequences both for the relationship and the individual dyad members.

I next describe the theoretical framework for my predictions about self-control decisions in dyads. I then report seven studies involving lab, virtual, and real dyads in three different self-control domains, each of which robustly demonstrates our predicted pattern of effects. I close with a discussion of implications, limitations, and opportunities for future research.

4.1 THEORETICAL FRAMEWORK

4.1.1 When tendencies agree: homogeneous dyads

One way to approach the question of joint self-regulation is to consider the way that dyads may be composed. Individuals can be classified as chronically low or high at trait self-control based on their responses to a validated measure of self-control (Baumeister 2002; Brief Self-Control Scale, Tangney et al. 2004). Trait self-control is an individual difference in the amount of self-regulatory resources one possesses that forms a stable aspect of personality (Baumeister 2002). Across different situations and time, some individuals are better than others at overriding their automatic urges and forgoing short-term temptations that would otherwise impede the accomplishment of long-term or higher-level goals (Ainslie and Haslam 1992; Baumeister 2002; Heatherton, and Tice 1994; Tangney et al. 2004; Thaler 1991; Trope and Fishbach 2000; Wertenbroch 1998). As a result, trait self-control has been shown to reliably predict a wide range of behaviors such as school and work performance, financial management, eating, addictive behavior, affect regulation, deviant behavior, interpersonal functioning, planning and decision

making (Baumeister et al. 1998; deRidder et al. 2012; Muraven and Baumeister 2000; Tangney et al. 2004).

Given this understanding of trait self-control, consider the case of a homogeneous high self-control couple, which consists of two high self-control partners. I predict that when two high self-control individuals work together on a self-regulatory decision or task, they will jointly make decisions associated more with long-term goals than with immediate indulgence: they will choose healthier, but likely less tasty foods, resist the temptation to incur debt to pursue indulgence, or persevere rather than give up at challenging tasks. By contrast, often despite stated beliefs that they care about long-term outcomes, lower self-control individuals are more likely to chronically pursue short-term indulgences (Poynor and Haws 2009). Thus, when two low-self-control individuals are paired, I anticipate they will both lean toward more indulgent options than those selected by homogeneous high self-control dyads. Formally:

H1: Homogeneous high self-control dyads will make less indulgent choices in joint self-regulation decisions than homogeneous low self-control dyads.

4.1.2 When tendencies conflict: mixed dyads and prorelationship behaviors

The more interesting case involves mixed dyads, where one member of the couple has high and the other one has low trait self-control. Understanding these dyads is particularly important in light of prior findings that in many marriages, "opposites attract," that is, members of couples are likely to differ in their self-control (Vohs et al. 2011).

A number of possibilities exist for the exhibited self-control of mixed dyads. First, it is possible that the presence of a high self-control partner will create accountability in the dyad (Seeley and Gardner 2006; Tetlock 1983). Since virtues are usually more easily justified than

vices (Okada 2005), an accountability mechanism would lead low self-control individuals to lean toward more virtuous options than they would on their own. It is also possible that high self-control individuals' observable achievements will act as social proof, suggesting that the high self-control individual's tendencies offer the surest route to success (VanDellen and Hoyle 2010). Such an effect would make the high self-control partner the more confident and trusted voice in the decision-making. Further, higher self-control individuals' ability to present themselves well or deal with difficult partners (Baumeister, Vohs, and Tice 2007; Vohs, Baumeister, and Ciarocco 2005) may raise their ability to persuade, prompting the low self-control individual to temporarily adopt their pursuit of long-term goals and agree to show restraint. If any of these mechanisms were at play in mixed dyads, we would see such pairs perform more like homogeneous high self-control than like homogeneous low self-control dyads.

However, I argue that the conflict of chronic inclinations created in mixed dyads leads to quite a different outcome than might be predicted by work focusing mostly on individual-level phenomena. This is because in a mixed dyad, high and low self-control partners' chronic inclinations are likely to be in conflict: while the high self-control individual is likely to focus on long-term goals, the low self-control individual will be drawn to immediate gratification (Tangney et al. 2004).

To resolve the conflict arising from the incompatible inclinations of the partners in a mixed dyad, one partner will need to put aside their chronic choice tendencies in the interest of a more *prorelationship behavior*, such as avoiding conflict and maintaining the harmony in the interaction (Finkel and Campbell 2001; Finkel and Rusbult 2008; Kelley and Thibaut 1978). Whether one engages in prorelationship behaviors depends on both the motivation and ability to do so (Finkel and Campbell 2001).

I propose that higher self-control individuals are likely to be both more able to engage in prorelationship behaviors and more motivated to do so than are their lower self-control partners. Past work suggests that inhibiting one's gut-level impulses to act in a self-interested manner in favor of more prorelationship behaviors tends to be associated with a higher chronic level of self-regulatory resources (Baumeister and Exline 1999, 2000; Yovetich and Rusbult 1994). Since high self-control individuals chronically possess more self-regulatory resources than low self-control individuals, they are better equipped to engage in prorelationship behaviors (Finkel and Campbell 2001). Further, past work suggests that high self-control individuals are more motivated to protect higher-level goals such as relationship harmony and success, even when doing so requires sacrifice on their part (Rawn and Vohs 2006; Tangney et al. 2004). Thus, high self-control individuals are more motivated to act in manners that preserve harmony such as accommodation in the face of relationship stressors (Finkel and Campbell 2001), forgiveness (Balliet, Li, and Joireman 2011; Pronk et al. 2010), promise-keeping (Peetz and Kammrath 2010), less aggression (DeWall et al. 2007), and more empathy (Tangney et al. 2004).

What will a prorelationship behavior look like in a joint decision-making context? Given that low self-control individuals will be more drawn to indulgent, short-term outcomes, we propose that the prorelationship behavior of the high self-control partner will be evidenced by a compromise toward greater indulgence in the joint decision. By assenting to their low self-control partner's preference, high self-control individuals avoid conflict that could arise from the differences in the partners' chronic inclinations and thus preserve the harmony in the interaction and the relationship. Therefore, rather than being enhanced by the presence of a high self-control partner, a mixed dyad's performance may instead be comparable to that of a homogeneous low self-control pair.

I note that my theory corroborates the view of individual self-control as being influenced by the person-situation interaction (Metcalfe and Mischel 1999). Specifically, Metcalfe and Mischel (1999) suggest that trait self-control may be displayed differently based on contextual factors, such that such factors may lead higher self-control individuals to indulge, or conversely, may prompt lower self-control individuals to exhibit restraint. Thus, while the tendency of higher trait self-control individuals is to exhibit restraint in their individual decisions (Tangney et al. 2004), in the context of a mixed dyad joint self-control task, I predict that they will assent to the other person's indulgent preferences in order to preserve the harmony in the interaction and the relationship.

I will refer to more indulgent or short-term gratification-oriented joint decisions as exhibiting less joint self-control, while joint outcomes that show more restraint or persistence are referred to as higher joint self-control decisions. I note that this is not to suggest that high trait self-control individuals demonstrate individual low self-control in this situation. Rather, given the lower self-control partner's preference for indulgence or short-term gratification, the higher self-control partner's prorelationship tendency may in fact lead to an indulgent decision, one that undermines both partners' ability to meet long-term goals such as saving money or eating a healthy diet, a pattern associated with low self-control in past literature (Baumeister 2002; deRidder et al. 2012; Tangney et al. 2004).

Formally, I therefore predict that:

H2: While homogeneous high self-control dyads will exhibit better self-control than will mixed self-control dyads, there will be no significant difference in the restraint displayed by mixed and low self-control dyads.

H3: As self-control rises, so do ability and motivation to behave in a prorelationship manner in joint decision-making contexts.

I test these hypotheses in seven studies (see table 2). Using arbitrarily created dyads in a lab setting, studies 1A and 1B support hypotheses 1 and 2 in both hypothetical (study 1A: selection of menu items) and real (study 1B: persistence on a difficult task) joint self-control tasks. In each study, homogeneous high self-control dyads exhibit more restraint than both homogeneous low self-control and mixed dyads; however, consistent with my predictions, there is no significant difference in the self-regulation of the latter two dyad types. Studies 2A and 2B reveal that actual married couples exhibit the same self-regulatory patterns as seen in the arbitrary lab pairings of individuals in studies 1A and 1B. Studies 3, 4A, and 4B examine the underlying mechanism driving these effects. Specifically, study 3 shows that higher self-control individuals possess greater motivation and greater ability to engage in prorelationship behaviors than do lower self-control individuals. Building on this finding, study 4A reveals that externally raising the prorelationship motivation of low self-control individuals significantly improves the mixed dyad's joint restraint, while study 4B shows that externally decreasing the high self-control individuals' prorelationship motivation can also elevate the mixed dyad's joint self-control. Thus, in addition to providing process evidence via a moderation-of-process design (Spencer, Zanna and Fong 2005), the last two studies also identify simple, practical messages that could be used to improve consumer well-being.

Table 2. Summary of Studies

Study	Dyads Creation Procedure	Dyad Type	H(s)	Dependent Variable(s)
Study 1A	Participants were randomly paired in the lab. Dyads were classified post-hoc as one of the three dyad types.	lab-created dyads	H1, H2	Total grams of fat in selected menu
Study 1B		lab-created dyads	H1, H2	Persistence on an unsolvable anagram (in sec)
Study 2A	Dyads were married couples. One spouse rated the trait self-control of both partners. Couples were classified post-hoc as one of the three dyad types.	married couples	H1, H2	Frequency of eating fast food, joint saving habits, retirement income, household savings (in $), joint spending habits, joint credit card debt (in $), frequency of paying joint credit card balance in full, and frequency of paying overall obligations on schedule
Study 2B	Dyads were married couples. Each spouse rated their own trait self-control individually. Couples were classified post-hoc as one of the three dyad types.	married couples	H1, H2	Willingness to incur credit card debt to purchase a luxurious vacation (in $)
Study 3 (process)	N/A	N/A	H3	Ability and motivation to engage in prorelationship behaviors
Study 4A (process and intervention)	Virtual dyads were created by modeling non-respondent spouse's preferences in ways consistent with respondent spouse's self-control ratings of their partner.	virtual dyads	H1, H2, H3	Preference for a $50 groceries gift card relative to a $50 restaurant gift card; likelihood of selecting each gift card; amount allocated to each gift certificate; gift card choice
Study 4B (process and intervention)	Participants were randomly paired in the lab based on their trait self-control to create mixed dyads.	lab-created dyads	H1, H2, H3	Restaurant gift card preference

4.2 STUDY 1: SELF-CONTROL IN LAB-CREATED DYADS

Studies 1A and 1B test hypotheses 1 and 2. In both studies, lab participants were paired with another participant in their session to form the three focal dyad types (homogeneous low self-control, mixed self-control, and homogeneous high self-control dyads). All dyads were then given an opportunity to make a joint self-control decision, either involving choices from a lunch menu (study 1A) or the length of time for which to persist at a challenging task (study 1B).

4.3 STUDY 1A

4.3.1 Method

Study 1A used a 3 (dyad type: homogeneous low self-control, mixed, homogeneous high self-control) group design. A total of 74 individual participants (61% male; M_{age} = 20.5 years) from an introductory marketing course at the University of Pittsburgh completed the study in exchange for course credit.

First, all participants filled out the 13-item self-control scale designed to measure individual differences in trait self-control (Tangney et al. 2004). All respondents were then given a series of unrelated tasks to work on for approximately 15 minutes. While participants were working on these tasks, the lab administrator calculated each individual's trait self-control score and classified participants as low or high self-control depending on whether their score was

below or above the average self-control in the population, determined by a separate pretest (M = 4.20, SD = .63). Then, the lab administrator paired each participant with a partner of either a different or similar self-control level in order to create the three types of self-control dyads: homogeneous low self-control (n = 12), mixed (n = 19), and homogeneous high self-control (n = 6). Participants in each dyad were then asked to work together on a subsequent menu selection task, with instructions intended to ensure that they treated the task as a joint task and did not select their own individual menus instead:

> "Now imagine that you and your partner in this study have decided to have lunch together at a small local restaurant located close to the school. The restaurant has an ongoing lunch promotion called "A Lunch Menu for 2 for Half the Price", which basically means that you will get 50% discount off your bill if you both order the same meals. You and your partner decide to take advantage of this promotion. You both have the goal of staying in shape this semester. So you agree to try to balance your desire to choose something healthy – low in fat and calories – with something delicious that you'll both like."

Each pair was then given a lunch menu and asked to circle the foods they would like to order together. The menu contained a list of the available lunch options along with information about their caloric and fat content. After completion of the menu selection task, all participants provided their demographic information, were thanked for their participation, and dismissed.

A separate group of participants (n = 101) was given to read a description of this scenario and asked to indicate how realistic it is, as well as how realistic it is in general to share meals in order to take advantage of an available promotion at a restaurant. Results revealed that the scenario is realistic (M = 5.21, SD = 1.53 vs. 4 (scale midpoint); $t(100) = 7.93$, $p < .0001$) and that it is realistic to decide to share meals to utilize an available promotion when eating out (M = 6.08, SD = 1.25 vs. 4 (scale midpoint); $t(100) = 16.76$, $p < .0001$).

4.3.2 Analysis and results

In all experiments partial data were provided by some respondents on some variables; where data are available, they are included in the analysis.

4.3.2.1 Partners' self-control in the three dyad types

I first checked to ensure that low self-control and high self-control individuals had equivalent self-control scores no matter whether they were placed in homogeneous or mixed dyads. As intended, the high self-control partners in the homogeneous high self-control and mixed dyads had significantly higher self-control scores than the low self-control partners in homogeneous low self-control and mixed dyads (all $p < .0001$). Furthermore, the mean self-control score of high self-control individuals placed in homogeneous dyads ($M = 4.67$, $SD = .30$) was not significantly different from that of high self-control individuals placed in mixed dyads ($M = 4.82$, $SD = .54$; $p = .37$); the mean self-control of low self-control partners in homogeneous dyads ($M = 3.83$, $SD = .61$) was slightly higher than that of low self-control partners in mixed dyads ($M = 3.49$, $SD = .48$; $p = .05$). To ensure that this inadvertent difference does not confound our results, I conduct the same analysis in all other studies; this issue did not arise in any of them.

4.3.2.2 Total grams of fat in selected menu

I used the total grams of fat in the selected menu as our measure of self-control, such that higher fat content signaled less self-control (Fujita and Han 2009; Giner-Sorrola 2001). To account for the unequal number of pairs in the three conditions resulting from the nature of the participants in the sessions, a weighted-means ANOVA was estimated (Keppel and Zedeck

1989) using the total grams of fat in the selected menu as the dependent variable and the dyad type as the between-subjects factor. Results revealed a significant main effect of the dyad type on the total amount of fat, $F(2, 34) = 3.34$, $p < .05$ (see figure 12). As predicted in hypotheses 1 and 2, planned contrasts showed that the homogeneous high self-control dyads ($M = 20.17$, $SD = 6.13$) selected lunch menus that contained significantly less fat than did the homogeneous low self-control dyads ($M = 54.83$, $SD = 10.26$), $F(1, 34) = 5.65$, $p = .02$. The homogeneous high self-control dyads also chose less fatty menus than did the mixed dyads ($M = 50.26$, $SD = 11.23$), $F(1, 34) = 4.26$, $p < .05$. However, the menus selected by homogeneous low self-control and mixed pairs did not differ significantly from each other in terms of their fat content ($p = .76$). We obtained the same results when we used the total amount of calories in the selected menu as the dependent variable; amount of calories and grams of fat in the chosen menu are highly correlated ($r = .97$, $p < .0001$).

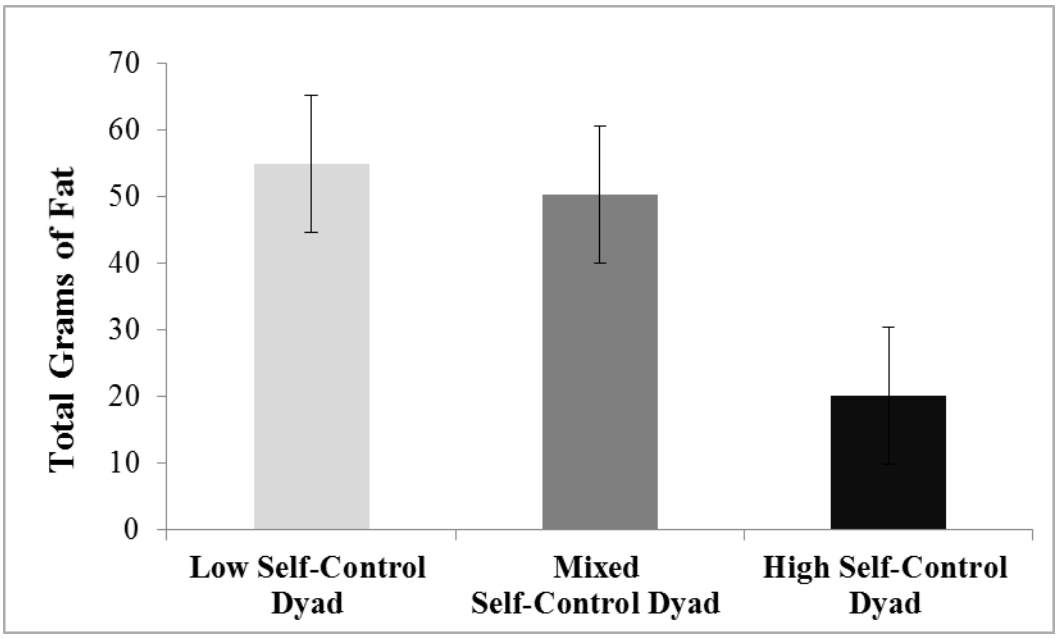


Figure 12. Total Grams of Fat in the Selected Menus by the Three Dyad Types

4.4 STUDY 1B

Given the use of a hypothetical, scenario-based self-control measure, it might be argued that the observed differences in the self-regulation of the three dyad types in study 1A are due to differences in their lay theories about how they would behave in such situations. That is, higher self-control individuals might intuit that they would assent to their partner's preferences on such a choice, but might show stronger adherence to self-regulation in an actual task. Therefore, I sought to replicate these effects using a real self-control behavior in study 1B. Furthermore, study 1B also aims to replicate the effects using a larger sample size to account for the small cell sizes in study 1A.

4.4.1 Method

Study 1B used a 3 cell (dyad type: homogeneous low self-control, mixed, homogeneous high self-control) design. Individual participants (n = 240; 57% male; M_{age} = 20.4 years) were students at the University of Pittsburgh who completed the study for course credit.

Participants first filled out the Brief Self-Control Scale (Tangney et al. 2004), worked individually on several unrelated filler tasks taking approximately 25 minutes, and then were randomly paired with a partner from the same experimental session. All dyads were then asked to work together on an anagram solving task, which contained four solvable and one unsolvable anagram. Following prior research (Muraven, Tice, and Baumeister 1998), I used the persistence of the dyads at attempting to solve the unsolvable anagram as a measure of their self-control. Persisting on a challenging task requires overriding an easy, appealing response (i.e., quitting) and hence constitutes a self-control task (Muraven et al. 1998). The experimenter was present in

the lab session to ensure that both members of the dyads participated in the anagram task jointly, and noted that in no cases did it appear that the task was simply delegated to one or the other member of the group. I note that this was a joint self-control task as both partners had to jointly decide whether to keep working on the anagrams or proceed with the study and ultimately leave the lab. It was not possible for one partner to proceed with the study and leave the lab without the other partner.

4.4.2 Analysis and results

I excluded from the analysis seven pairs in which one or both of the partners did not provide responses to the self-control scale and thus could not be assigned to a condition, as well as 13 additional pairs that encountered logistical issues during the study administration (i.e., were interrupted or had computer problems during the anagram solving task). For the remaining pairs, I used the average self-control in the sample (M = 4.31, SD = .59) to classify participants as low or high self-control individuals. Then, depending on each partner's classification, we classified each pair as one of the three dyad types under study – homogeneous low (n = 30), mixed (n = 48), and homogeneous high self-control dyads (n = 22).

4.4.2.1 Partners' self-control scores in the three dyad types

Similarly to study 1A, I ensured that both low and high self-control individuals had comparable self-control scores irrespective of whether they were placed in homogeneous or mixed dyads (both *p's* > .35). Moreover, high self-control partners in both homogeneous and mixed dyads had higher self-control than low self-control partners in homogeneous and mixed dyads (all *p's* < .0001). The mean self-control levels of the partners in the three dyads were as

follows: homogeneous low self-control dyads: M = 3.85, SD = .33; homogeneous high self-control dyads: M = 4.78, SD = .34; high self-control partners in mixed dyads: M = 4.83, SD = .32; low self-control partners in mixed dyads: M = 3.92, SD = .32. The same analyses were conducted in all other studies; the results were similar and thus are not discussed further.

4.4.2.2 Persistence time

I first note that there were no significant differences among the three dyads in the time spent on the four solvable anagrams (all $p > .23$). This result is not surprising given the fact that those anagrams were relatively easy and were thus solved by almost all dyads. Time spent working on the unsolvable anagram was significantly skewed (skewness = 1.13; Shapiro Wilk's W = .912, $p < .0001$). I therefore conducted a one-way ANOVA on the log-transformed persistence time as a function of the dyad type condition. Results revealed a significant main effect of dyad type, $F(2, 97) = 6.10$, $p = .003$ see figure 13). Homogeneous high self-control dyads persisted significantly longer (log-transformed M = 4.61, SD = .48; raw M = 111.9 sec, SD = 53.84) at attempting to solve the unsolvable anagram than both the homogeneous low self-control (log-transformed M = 4.06, SD = .54; raw M = 66.7 sec, SD = 37.72; $F(1, 97) = 11.98$, $p < .001$) and mixed dyads (log-transformed M = 4.24, SD = .62; raw M = 82.3 sec, SD = 48.78; $F(1, 97) = 6.44$, $p = .01$). Again consistent with study 1A, there was no significant difference between the persistence of the latter two dyads ($p = .17$).

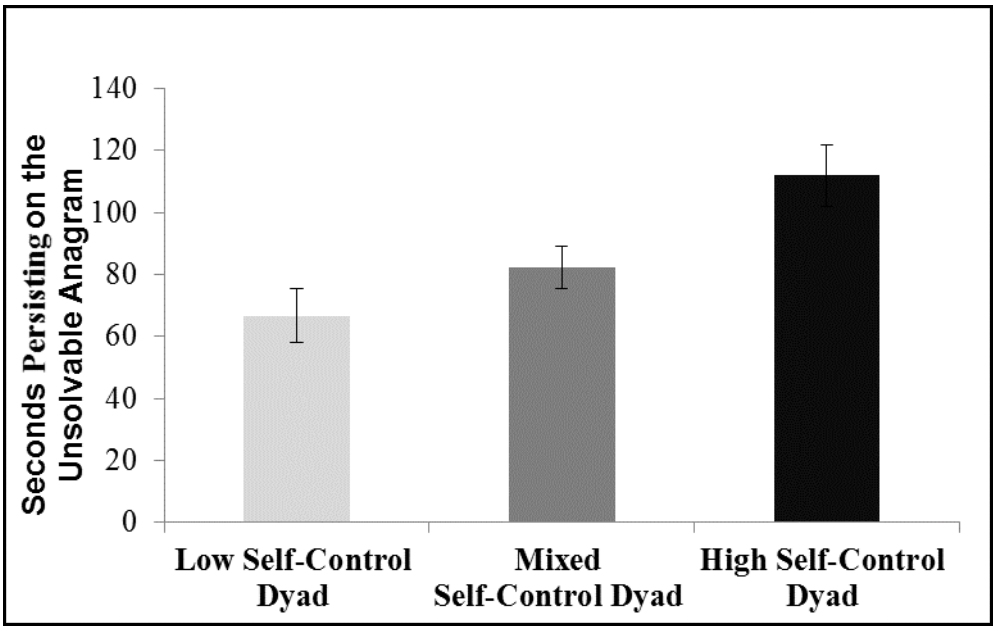


Figure 13. Time Persisting at an Unsolvable Anagram of the Three Dyad Types

4.4.3 Discussion

Studies 1A and 1B provide support for hypotheses 1 and 2, showing that homogeneous high self-control dyads made more healthy choices and showed greater persistence than did both homogeneous low self-control and mixed self-control pairs, as reflected in both hypothetical and actual joint self-control decisions. However, as predicted, there were no significant differences in the self-regulatory behaviors of the latter two types of dyads. Essentially, these results suggest that having one high self-control individual in the dyad might not be enough to ensure its successful self-control in joint endeavors.

The advantage of using lab-created dyads in the first two studies is that the manipulation of the dyad type eliminates any self-selection concerns. However, since the dyads in the first two studies were ad-hoc pairings, it might be argued that the results might not persist or might be completely different in enduring relationships. Perhaps over the course of a longer relationship, a

high self-control individual would enforce their standards on a low self-control partner, thus enhancing the overall performance of the dyad. Further, it could be argued that the decisions made in these studies, while requiring self-regulatory resources, were somewhat atypical and did not have long-term consequences for the dyads, making it less important for the higher self-control partner to preserve their chronic tendencies. Therefore, studies 2A and 2B test hypotheses 1 and 2 using actual married couples to see if results persist when long-term patterns of behavior may lead to different life outcomes for both individuals. Furthermore, using married couples allows me to see if our results hold in a situation where the high self-control partner's observable achievements might act as social proof and thus could elevate the self-control performance of mixed dyads to that of homogeneous high self-control.

4.5 STUDY 2A: SELF-CONTROL IN MARRIED COUPLES

4.5.1 Method

Married members of Amazon's Mechanical Turk panel (n = 205, 35% males; M_{age} = 37.4 years) completed the survey online in exchange for a small payment. Participants were first asked to rate their own trait self-control using the Brief Self-Control Scale (Tangney et al. 2004; α = .90). After that, similar to Righetti and Finkenauer (2011), respondents used a modified version of the same scale to rate their spouse's trait self-control (α = .88; sample items: "My spouse is good at resisting temptation," "Pleasure and fun sometimes keep my spouse from getting work done."). To assess participants' knowledge of their spouses and confidence in their ability to judge their partners' self-control, I asked them to answer the following questions: "How well do you know

your spouse?" and "How confident are you in your ability to judge your spouse's self-control?", both measured on a seven-point scale anchored by 1 = "Not At All" and 7 = "Very Much".

After a filler task designed to clear working memory, participants completed a set of measures of the couple's joint self-control success in the three self-control domains of interest (eating, saving, and spending): frequency of eating fast food, joint saving habits, retirement income, household savings (in $), joint spending habits, joint credit card debt (in $), frequency of paying joint credit card balance in full, and frequency of paying overall obligations on schedule. All measures were objective measures (rather than perceptions-based) and can be found in table 3. Finally, I included also a measure designed to identify individuals who did not pay attention carefully (Oppenheimer, Meyvis, and Davidenko 2009; as used by Nelson and Simmons 2009).

Table 3. Joint Self-Control of Married Couples (Measures, Means, and Standard Deviations)

Self-Control Dependent Variable	$M_{hom\ LSC}$[a]	$M_{mixed\ SC}$	$M_{hom\ HSC}$
Joint Self-Control at Eating			
How often does your family eat fast food? Please enter a number below that indicates how many times per month your family eats fast food.	4.54 (3.78)[b] M_{log} = 1.52 (.64)	4.66 (5.14) M_{log} = 1.41(.81)	2.92 (2.85) M_{log} = 1.17 (.64)
Joint Self-Control at Saving			
How would you describe your and your spouse's joint saving habits? (a seven-point scale, 1 = We do not save at all, 7 = We save regularly by putting money aside each month)	4.05 (1.90)	4.39 (2.02)	5.59 (1.73)
How would you rate the retirement income you and your spouse receive (or expect to receive) from Social Security and job pensions? (a seven-point scale,1 = Totally Inadequate, 4 = Enough to Maintain Living Standards, 7 = Very Satisfactory; modified from the Federal Reserve Board's Survey of Consumer Finances)	3.05 (1.62)	3.24 (1.61)	3.79 (1.53)
At the household level, approximately how much money do you and your spouse have in saving and investment accounts (i.e., combined money in saving and investment accounts)?	$66,340 (119,576) M_{log} = 8.39 (3.99)	$80,372 (269,139) M_{log} = 8.17 (3.78)	$110,956 (201,394) M_{log} = 9.63 (3.15)
Joint Self-Control at Spending			
How would you describe your and your spouse's joint spending habits? (a seven-point scale, 1 = Usually spend more than our income, 4 = Usually spend as much as our income, 7 = Usually spend less than our income; modified from the FRB Survey of Consumer Finances)	4.41 (1.70)	4.83 (1.47)	5.58 (1.31)
Approximately how much joint credit card debt do you and your spouse currently have (i.e., combined credit card debt)?	$5,201 (7,595) M_{log} = 5.40 (4.18)	$5,986 (8,303) M_{log} = 5.50 (4.30)	$3,227 (6,785) M_{log} = 3.95 (4.16)
How often do you and your spouse pay your joint credit card balances in full? Please write N/A below if you do not have joint credit cards. (a seven-point scale, 1 = Never, we always carry a balance, 7 = We pay our entire balance every month; Nenkov, Inman, and Hulland 2007)	4.11 (2.33)	4.20 (2.47)	5.53 (1.99)
On average, are you paying off your overall debt ahead of schedule, behind schedule, or are the payments about on schedule? (a seven-point scale,1 = Behind Schedule, 4 = About on Schedule, 7 = Ahead of Schedule; modified from the FRB Survey of Consumer Finances)	4.30 (1.44)	4.41 (1.60)	5.26 (1.43)

Notes: (a) LSC stands for low self-control; HSC stands for high self-control. (b) Standard deviations in parentheses.

4.5.2 Analysis and results

I excluded 12 participants who failed the instructional manipulation check (following Nelson and Simmons 2009). Including those individuals does not change the results.

4.5.2.1 Participants' accuracy in the assessment of their spouses' trait self-control

I first assessed the extent to which participants felt they knew their spouse and were confident in their ability to judge their partner's self-control. Results revealed that participants felt they knew their spouses relatively well (M = 6.63, SD = .62, vs. 4.00 (scale midpoint), $t(192) = 59.35$, $p < .0001$) and exhibited relatively high confidence in their ability to judge their spouses' self-control (M = 6.13, SD = .91,vs. 4.00 (scale midpoint), $t(192) = 32.64$, $p < .0001$). To ensure that participants were indeed accurate in their assessments of the trait self-control of their spouses, I recontacted a subsample of our participants and asked them to have their spouse fill out a short questionnaire in exchange for small monetary payment (a total of 84 participants were contacted and 54 of them responded to our request, yielding a 64.3% response rate). In this survey, the spouses of our participants were asked to rate their own self-control using the Brief Self-Control Scale (Tangney et al. 2004). There was a high correlation between participants' assessments of their spouses' self-control and their spouses' self-reported self-control (r = .72, $p < .0001$). I note that these results are in line with previous work of Righetti and Finkenauer (2011), who also demonstrate that people in close relationships can detect their partner's trait self-control.

4.5.2.2 Couples' joint self-control

I used participants' ratings of their own self-control and their spouse's self-control to classify the couples as one of the three dyad types (homogeneous low (n = 56), mixed (n = 71), and high self-control (n = 66) dyads) in the same way as in study 1B. Three of the couples' joint self-control outcome measures (times eating fast food per month, amount of savings, and amount of credit card debt) were significantly positively skewed and therefore were log-transformed.

I conducted separate ANOVAs on the eight different joint self-control measures using the dyad type as the between-subjects factor. Results revealed a significant main effect on each of the outcomes of interest (see tables 3 and 4). Follow-up analysis showed that homogeneous high self-control couples eat fast food less frequently, had better saving and spending habits, had more satisfactory retirement income and more savings, owed significantly less money in joint credit card debt, paid their credit card balances in full more frequently, and were more likely to be ahead of schedule in paying down their overall obligations (mortgages, student and car loans, etc.) than both homogeneous low self-control and mixed couples. Importantly, though, consistent with hypothesis 2, there were no significant differences between the homogeneous low self-control and mixed couples on any of the joint self-control measures (all p = NS).

Table 4. ANOVA Results

	Main Effect of Dyad Type	Planned Contrasts		
		Homogeneous LSC vs. Homogeneous HSC Dyads[a]	**Mixed vs. Homogeneous HSC Dyads**	**Homogeneous LSC vs. Mixed Dyads**
Times Eating Fast Food per Month	$F(2, 189) = 3.86$, $p = .02$[b]	$F(1, 189) = 7.14$, $p < .01$	$F(1, 189) = 3.86$, $p = .05$	$F(1, 189) = .68$, $p = .41$
Joint Savings Habits	$F(2, 190) = 11.55$, $p < .0001$	$F(1, 190) = 20.07$, $p < .0001$	$F(1, 190) = 13.73$, $p < .001$	$F(1, 190) = 1.02$, $p = .31$
Retirement Income	$F(2, 190) = 3.64$, $p = .03$	$F(1, 190) = 4.08$, $p = .04$	$F(1, 190) = 6.48$, $p = .01$	$F(1, 190) = .43$, $p = .51$
Amount of Savings	$F(2, 187) = 3.01$, $p = .05$	$F(1, 187) = 5.33$, $p = .02$	$F(1, 187) = 3.45$, $p = .07$	$F(1, 187) = .11$, $p = .74$
Joint Spending Habits	$F(2, 190) = 9.66$, $p < .0001$	$F(1, 190) = 18.44$, $p = .0001$	$F(1, 190) = 8.51$, $p < .01$	$F(1, 190) = 2.48$, $p = .12$
Amount of Credit Card Debt	$F(2, 141) = 3.73$, $p = .03$[c]	$F(1, 141) = 3.63$, $p = .06$	$F(1, 141) = 6.75$, $p = .01$	$F(1, 141) = .02$, $p = .90$
Frequency of Paying Credit Card Balances in Full	$F(2, 141) = 6.25$, $p < .01$	$F(1, 141) = 8.88$, $p < .01$	$F(1, 141) = 9.17$, $p < .01$	$F(1, 141) = .04$, $p = .85$
Frequency of Paying Overall Debt on Schedule	$F(2, 189) = 7.84$, $p < .001$	$F(1, 189) = 12.32$, $p < .001$	$F(1, 189) = 11.02$, $p < .01$	$F(1, 189) = .15$, $p = .70$

Notes: (a) LSC stands for low self-control; HSC stands for high self-control. (b) Partial data were provided by some respondents on some variables; where data are available, they are included in the analysis. (c) Forty-nine participants indicated that they did not possess joint credit cards with their spouses. Therefore, the degrees of freedom for the amount of credit card debt and the frequency of paying joint credit card balances in full are smaller than those for all other measures.

4.5.3 Discussion

Replicating studies 1A and 1B, homogeneous high self-control couples appeared to exhibit more self-control in spending, saving, and eating than did both homogeneous low self-control and mixed couples. However, as predicted and seen in the lab experiments, there were no differences between mixed and homogeneous low self-control dyads in any of the self-control domains considered. That is, married couples exhibited the same patterns of restraint and indulgence across a variety of important self-control domains as did our pairings of participants in the lab. Importantly, this study also ruled out the possibility that in the interactions of mixed dyads over extended periods of time, the higher self-control partner would become the more trusted voice in the decision making due to their observable achievements. Furthermore, in contrast to the one-shot behaviors examined in the first two studies, in this study all self-control measures were cumulative outcomes, which are the result of an aggregation of self-control behaviors across time and different situations, and as such are more robust measures of self-control success (Haws et al. 2013).

Given the convergence between spouses' ratings revealed in the re-contact evaluations and the previous work of Righetti and Finkenauer (2011), I have confidence that participants reported their spouses' trait self-control with a reasonable level of accuracy. However, since this study relied only on the responses/perceptions of one of the spouses in the couple, it would be ideal to obtain individual self-evaluations from both spouses. Thus, the next study demonstrates our effects again with married couples, but in contexts in which both spouses report their own self-control and actively participate in an experimental decision making process.

4.6 STUDY 2B: SELF-CONTROL IN MARRIED COUPLES

4.6.1 Method

Study 2B followed a 3 (dyad type: homogeneous low self-control, mixed, homogeneous high self-control) group design. I recruited couples (n = 63; $M_{\text{wives' age}}$ = 41 years; $M_{\text{husbands' age}}$ = 43 years) at church coffee hours, who completed the study in exchange for a payment of $10.

The couples were presented with an imagination task, in which they were asked to imagine as vividly as possible the following scenario:

> "Now please imagine that while looking for a quiet getaway destination for an upcoming weekend, you came across a good deal for an amazing 3-day vacation in the Bahamas. The price for an all-inclusive vacation for both of you ranges between $1200 and $2200, depending on how luxurious a package you choose. The amount of money you have allocated for this weekend totals $1000. If you decide to book the 3-day vacation in the Bahamas, you would need to put any amount above this (ranging from $200 to $1200) on your credit card."

At the end of the scenario, participants were asked to make a joint decision and indicate how much money they were willing to charge on their credit cards in order to purchase the 3-day vacation in the Bahamas. The amount of money that participants were willing to put on their credit cards (between $0 and $1200; hereafter referred to as the debt amount) was used as a measure of the couple's joint self-control (following Mansfield, Bethpinto, and Parente (2003) and Meier and Sprenger (2010)). After completing approximately 2 pages of other attitudinal measures, filler questions and demographics, the spouses were separated and privately responded to the Brief Self-Control Scale (Tangney et al. 2004).

4.6.2 Analysis and results

I classified the couples post-hoc as one of the three dyad types in the same way as in prior experiments – homogeneous low self-control (n = 15), mixed (n = 35), and homogeneous high self-control (n = 13) couples.

To account for the excess number of zeros on the dependent variable and its skewed distribution (skewness = 1.10; Shapiro Wilk W = .848, p < .0001), a Zero-Inflated Poisson regression (Lambert 1992) was run in which the couple's debt amount was predicted by the dyad type. The results of the regression model indicated a significant main effect of the dyad type, χ^2 (2) = 103.15, p < .0001 (the change in the log-likelihood between the null and the full models). Results further demonstrated that the homogeneous low self-control and the mixed couples were both willing to charge about 1.3 times more money on their credit cards in order to book the indulgent vacation than the homogeneous high self-control couples, b = .26, exp(b) = 1.30, Wald $\chi^2(1)$ = 149.02, p < .0001 and b = .23, exp(b) = 1.26, Wald $\chi^2(1)$ = 167.29, p < .0001 respectively. Finally, there were no significant differences between the homogeneous low self-control and the mixed couples in the amount of debt they were willing to incur (p = .16).

4.6.3 Discussion

Study 2B replicated the findings from the first three studies and provided additional support for hypotheses 1 and 2. In contrast to study 2A where I relied on the responses of only one of the spouses, in this study I collected data from both spouses working together at the same time. Furthermore, similar to studies 1A and 1B, in this study I used an observable, close-ended, one-shot decision as a measure of the couples' joint self-control, which complements the use of

cumulative outcomes in study 2A. Again, I observe convergent patterns. When presented with a hypothetical situation in which the couple had to incur debt in order to purchase an indulgent vacation, homogeneous high self-control couples were willing to charge significantly less money to their credit cards than homogeneous low self-control and mixed couples. However, as predicted, there was no significant difference in the self-regulation exhibited by the latter two types of dyads.

The next three studies attempt to elucidate the mechanism driving these effects. Specifically, study 3 aims to provide support for hypothesis 3 and demonstrate that higher self-control individuals possess greater ability and motivation to engage in prorelationship behaviors when making joint decisions with other people. Building on this finding, studies 4A and 4B provide additional process evidence using a moderation-of-process design and show that the self-control behaviors of mixed dyads can be altered predictably by manipulating the motivation component of the tendency to engage in prorelationship behaviors.

4.7 STUDY 3: TRAIT SELF-CONTROL AND PRORELATIONSHIP BEHAVIORS

4.7.1 Method

Participants (n = 192, 48% males; M_{age} = 30.7 years) were recruited through Amazon's Mechanical Turk and asked to complete a short survey online in exchange for a small payment. Participants were first asked to imagine that they are making a joint decision with someone else (i.e., their spouse, a friend of theirs, or colleague). Following Ryan and Deci (2000), to capture participants' motivation to act in a prorelationship manner, I asked them to indicate how much

they valued each of seven prorelationship behaviors: "Avoiding conflict between me and my partner," "Keeping things smooth between me and my partner," "Maintaining harmony between me and my partner," "Getting along with my partner," " Avoiding tension between me and my partner," "Reaching a decision that my partners is happy about," and "Acting in a way that would be beneficial to the relationship with my partner," on a seven-point scale, anchored by 1 = "Not Important At All" and 7 = "Extremely Important." To assess participants' ability to act in a prorelationship manner, I asked them to think about their past experiences in making joint decisions and indicate how able they usually were to exhibit each of the above seven behaviors in such situations using a seven-point scale, where 1 = "Not At All" and 7 = "Very Much."

Finally, participants completed a filler task (i.e., rated their enjoyment of different pictures), responded to the Brief Self-Control Scale (Tangney et al. 2004), and provided their demographic information.

4.7.2 Analysis and results

An explanatory factor analysis with a varimax rotation conducted on the fourteen motivation- and ability-related items revealed a two-factor structure; all motivation-related items loaded significantly on one factor (factor loadings ranging from .70 to .91), while the ability-related items loaded significantly on a second factor (factor loadings ranging from .73 and .92). I averaged the items that loaded on each of the two factors to create the following composite indices: a seven-item scale measuring motivation to engage in prorelationship behaviors (α = .94); a seven-item scale measuring ability to engage in prorelationship behaviors (α = .95).

Two simple regressions revealed that trait self-control was a significant positive predictor of both participants' motivation, b = .15, $t(190) = 2.42$, $p = .02$, and ability to engage in prorelationship behaviors, b = .37, $t(190) = 5.20$, $p < .0001$.

4.7.3 Discussion

Study 3 provided support for hypothesis 3, revealing that high self-control is associated with greater motivation and greater ability to act in a prorelationship manner. This means that in a mixed dyad (in which the chronic inclinations of the two partners are in conflict), the high self-control partner will be more likely to assent to their lower self-control partner's preferences - a proclivity which may help explain relationship success (Tangney et al. 2004) but leads to suboptimal joint self-regulatory outcomes. In the next two studies I build on these correlational findings experimentally.

4.8 STUDY 4: PROCESS AND INTERVENTIONS

The objective of the next two studies was to provide more robust process evidence using a moderation-of-process design (Spencer, Zanna, and Fong 2005), as well as to test two interventions that could improve the self-control of mixed dyads. My theory and findings so far suggest that low self-control individuals are less likely to compromise in mixed dyads because they possess lower motivation and lower ability to engage in prorelationship behaviors than high self-control individuals. In the next two studies I provide process evidence by manipulating the *motivation* component of the tendency to engage prorelationship behaviors.

4.9 STUDY 4A

In study 4A I gave an intervention designed to increase motivation to engage in prorelationship behaviors to one of the partners in the mixed dyad (either the low or the high self-control partner) or none of the partners. I argue that externally increasing the low self-control partner's motivation to act in a prorelationship manner should prompt them to yield to the beneficial influence of their high self-control partner. If the low self-control partner shows willingness to compromise, the high self-control partner no longer needs to. As a result, the joint self-control of mixed dyads in which the low self-control partner receives the intervention should improve relative to homogeneous low self-control and no-intervention mixed dyads, and be comparable to that of homogeneous high self-control dyads. In contrast, if the prorelationship account holds, externally increasing the high self-control partner's motivation to engage in prorelationship behaviors should not make a difference – the joint self-control of mixed dyads in which the high self-control partner receives the intervention should be similar to that of homogeneous low and no-intervention mixed dyads and significantly lower than that of homogeneous high self-control dyads.

4.9.1 Method

Married participants (n = 398, 51% males, M_{age} = 35.4 years) were recruited through Amazon's Mechanical Turk and completed the study online in exchange for a small payment.

Study 4A followed a 5 group design. Three cells should replicate our prior effects: (homogeneous low self-control dyad (n = 95), no-intervention mixed dyads (n = 100), homogeneous high self-control dyad (n = 100)). However, I also added two cells in which we

would test for moderation of prior patterns: mixed dyads in which the low self-control partner received the high prorelationship motivation intervention (n = 55), and mixed dyads in which the high self-control partner received the high prorelationship motivation intervention (n = 48).

First, as in study 2A, participants rated their own and their spouse's self-control using the Brief Self-Control Scale (Tangney et al. 2004) The trait self-control ratings were used to classify both the participant and his/her spouse as either low or high self-control individuals as in previous studies and identify the type of dyad they were in (homogeneous low self-control, mixed, or homogeneous high self-control). The non-participant spouse's trait self-control rating was also used to infer their behavior in the experimental situation, as described below. After completing a series of filler tasks, participants were told that in the following task they would have to imagine themselves making several joint decisions with their spouse and asked to enter their spouse's name.

Then before proceeding to the joint decisions, participants who were in a mixed couple were randomly assigned to either a *high prorelationship motivation intervention* or *no intervention* condition. Respondents in the *high prorelationship motivation intervention* condition were asked to read the following paragraph before proceeding to the joint decision:

> "Past research has shown that you perform significantly better if you put more emphasis on maintaining harmony and keeping things smooth between you and your partner rather than coming to a joint decision that you would personally really enjoy in the short run. It is better to avoid conflict and tension, such that your partner is happy with your joint decision. Getting along is more important than making a decision that would be pleasant for you in the short run."

Note that the paragraph was created using the exact wording of the items used to measure this construct in study 3. Respondents in the *no intervention* condition were not given such instructions.

After that, all participants were told that one randomly selected couple would receive a $50 gift card of their choice. They were asked to imagine that they had to decide together with their spouse which gift card to select (similar to Wilcox et al. 2011) and that their spouse had given them one of two recommendations (i.e. a recommendation to indulge or a recommendation to restrain). I used the non-participant spouse's self-control ratings taken earlier in the session to realistically represent their behavior in this situation. I thus assigned each participant a recommendation consistent with their spouse's self-control rating (i.e., a recommendation to indulge if the participant's spouse was a low self-control individual; a recommendation to restrain if the participant's spouse was a high self-control individual).

For instance, first consider a low self-control respondent who rated their spouse as low in self-control. This would be classified as a homogeneous low self-control dyad. In the experimental scenario, the participant would be asked to imagine that they are making the decisions together with their spouse and their spouse says: "I really want us to go out for dinner. Let's indulge ourselves and choose the restaurant gift certificate...." In other words, the low self-control partner's behavior in this situation would be exhibited in their preference for indulgence. Similarly, consider a homogeneous high self-control dyad consisting of a high self-control participant and a high self-control spouse. Participants in such dyads were asked to imagine that their spouse made a recommendation to restrain, saying "I really think that we should use the money for groceries. Let's be prudent and choose the groceries gift certificate..." Finally, a mixed dyad could be composed in one of two ways. A low self-control participant and could have rated their spouse as high self-control spouse. In this case, the spouse's preference would be virtually represented by a recommendation to restrain and choose the grocery gift card. Alternately, a high self-control participant might have rated their spouse as low in self-control. In this case, the non-

participant spouse would express a recommendation to choose the more indulgent restaurant gift card. Thus, these recommendations allowed me to model the virtual presence of the spouse in the decision-making using their trait self-control.

Participants then indicated the preference they had for the two gift cards in the joint decision on a seven-point scale, anchored by 1 = ”Strongly prefer the $50 restaurant gift certificate” and 7 = “Strongly prefer the $50 groceries gift certificate,” and the likelihood of the pair selecting each gift card on a seven-point scale where 1 = “Very Unlikely” and 7 = “Very Likely”. Further, I asked participants to select which certificate the couple would like to receive if they were the winner of the lottery. Participants were also given the option to allocate their shared $50 award between the two gift certificates.

At the end of the study, participants rated both the restaurant and the groceries gift card on a seven-point scale, anchored by 1 = “Complete necessity – we have to buy them” and 7 = “Complete luxury – nice to have but not necessary at all” (used as manipulation checks). They also reported how realistic the recommendation given by their spouse was (“If you and your spouse were actually making the gift cards decisions together, how likely is he/she to give the same recommendation as in this study?” on a seven-point scale where 1 = “Very Unlikely” and 7 = “Very Likely”) and provided their demographic information.

4.9.2 Analysis and results

4.9.2.1 Participants’ accuracy and manipulation checks

Similar to study 2A, in order to ensure that participants were indeed accurate in their assessments of the trait self-control of their spouses, I recontacted a subsample of our participants and asked them to have their spouse fill out the Brief Self-Control Scale (Tangney et

al. 2004) in exchange for small monetary payment (a total of 123 participants were contacted and 66 of them responded to our request, thus yielding a 53.7% response rate). Correlational analysis revealed that there was a high correlation between participants' assessments of their spouses' self-control and their spouses' actual self-control (r = .58, $p < .0001$), thus confirming that participants were indeed accurate in their judgments of their spouses' self-control and that the use of their assessments as proxies of their partners' actual self-control was warranted. I also examined participants' ratings of how realistic the recommendation they were assigned was. Results reveal that the assigned recommendations given in the experimental scenario was realistic ($M = 5.40$, $SD = 1.92$ vs. 4 (scale midpoint); $t(397) = 14.56$, $p < .0001$), which suggests that using the spouse's trait self-control to model their virtual presence was also warranted.

In addition I checked whether our respondents perceived the restaurant gift card as a luxury and the groceries gift card as a necessity. Results revealed that the restaurant gift card was considered by our participants to be a luxury ($M = 6.18$, $SD = .99$ vs. 4 (scale midpoint); $t(397) = 43.94$, $p < .0001$); in contrast, the groceries gift card was viewed as more of a necessity ($M = 1.39$, $SD = .89$ vs. 4 (scale midpoint); $t(397) = -58.24$, $p < .0001$).

4.9.2.2 Gift certificate preferences and allocation decisions

I conducted a one-way MANOVA to account for the significant correlations among the five outcomes of interest (all $p < .0001$). All results supported my predictions (see table 5).

Table 5. MANOVA Results

	Overall Effect		Gift Card Preference	Likelihood of Choosing the Restaurant Card	Likelihood of Choosing the Groceries Card	Restaurant Gift Card Amount	Groceries Gift Card Amount
	Wilk's Lambda	F-value	F-value	F-value	F-value	F-value	F-value
Main effect of dyad type	.81	5.46^{***a}	19.98***	14.18***	8.49***	13.18***	13.18***
Planned Contrasts							
homogeneous LSC[b] vs. no-intervention mixed dyads	1.00	.34	.78	1.10	0.21	.20	.20
homogeneous LSC vs. homogenous HSC	.92	8.99***	30.75***	18.34***	5.08*	16.67***	16.67***
no-intervention mixed vs. homogeneous HSC dyads	.94	6.62***	22.17***	10.67**	3.28 (p = .07)	13.46**	13.46**
homogeneous LSC vs. mixed dyads (intervention to LSC)	.89	11.47***	42.54***	33.52***	23.03***	28.48***	28.48***
no-intervention mixed vs. mixed dyads (intervention to LSC)	.91	9.07***	33.84***	24.39**	19.73***	24.91***	24.91***
homogeneous HSC vs. mixed dyads (intervention to LSC)	.98	2.36	3.42	4.79*	8.53**	3.62	3.62
homogeneous LSC vs. mixed dyads (intervention to HSC)	1.00	.31	.79	.93	.81	1.00	1.00
no-intervention mixed vs. mixed dyads (prorelationship intervention to HSC)	.99	.89	2.61	3.33	1.65	1.89	1.89
homogeneous HSC vs. mixed dyads (intervention to HSC)	.92	8.22***	29.37***	19.94***	7.56**	18.83***	18.83***
mixed dyads (intervention to LSC) vs. mixed dyads (intervention to HSC)	.90	11.34***	40.84***	33.99***	24.26***	29.96***	29.96***

Notes: (a) *** $p < .0001$, ** $p < .01$, * $p < .05$. (b) LSC stands for low self-control; HSC stands for high self-control; intervention stands for high prorelationship motivation intervention.

Replicating prior effects, planned contrasts revealed that homogeneous high self-control dyads showed significantly greater self-control than both homogeneous low self-control and no-intervention mixed dyads on all outcome variables; there was no significant difference between the latter two dyad types. However, as predicted, the intervention mixed dyads in which the low self-control partner received the high prorelationship motivation intervention showed significantly higher self-control than homogeneous low self-control, no-intervention mixed dyads, intervention mixed dyads in which the high self-control partner received the intervention, and even in some cases the homogeneous high self-control dyads. Conversely, the intervention mixed dyads in which the high self-control partner was targeted with the high prorelationship motivation intervention exhibited self-control similar to that of homogeneous low and mixed dyads, and significantly lower than that of homogeneous high self-control dyads. All means and standard deviations are indicated in table 6.

Table 6. Gift Card Preferences of the Five Dyad Types

	Gift Card Preference	**Likelihood of Choosing the Restaurant Card**	**Likelihood of Choosing the Groceries Card**	**Restaurant Gift Card Amount**	**Groceries Gift Card Amount**
Homogeneous LSC Dyad	3.66 (2.09)	5.24 (1.63)	4.88 (1.71)	$26.26 (16.03)	$23.74 (16.03)
No-Intervention Mixed Dyad	3.93 (2.34)	4.96 (1.99)	5.00 (1.86)	$25.21 (16.61)	$24.79 (16.61)
Homogeneous HSC Dyad	5.33 (1.99)	4.09 (1.99)	5.45 (1.83)	$16.80 (17.15)	$33.20 (17.15)
Mixed Dyad (Prorelationship Intervention to LSC)	5.98 (1.79)	3.40 (2.07)	6.31 (1.23)	$11.64 (14.56)	$38.36 (14.56)
Mixed Dyad (Prorelationship Intervention to HSC)	3.33 (2.15)	5.56 (1.61)	4.60 (1.93)	$29.13 (15.15)	$20.89 (15.15)

Note: Standard deviations in parentheses.

4.9.2.3 Gift certificate choice

A logistic regression on participants gift certificate choice (coded as 1 = groceries gift card selected and 0 = restaurant gift card selected) also revealed a significant main effect of the

dyad type (Wald χ^2 (4) = 46.34, $p < .0001$). The percentages of dyads choosing the groceries gift card in each condition are displayed in figure 14. Homogeneous high self-control dyads were more likely to select the groceries gift card than homogeneous low self-control dyads (b = 1.27, exp(b) = 3.56, Wald χ^2 (1) = 17.22, $p < .0001$) and no-intervention mixed dyads (b = 1.07, exp(b) = 2.93, Wald χ^2 (1) = 12.72, $p < .001$); no significant difference existed in the choices of the latter two dyads ($p = .50$). Moreover, the intervention mixed dyads in which the low self-control partner received the high prorelationship motivation intervention were more likely to choose the groceries gift card than homogeneous low self-control dyads (b = 2.20, exp(b) = 9.03, Wald χ^2 (1) = 23.44, $p < .0001$), no-intervention mixed dyads (b = 2.01, exp(b) = 7.43, Wald χ^2 (1) = 19.74, $p < .0001$), intervention mixed dyads in which the high self-control partner received the intervention (b = 2.62, exp(b) = 13.71, Wald χ^2 (1) = 26.63, $p < .0001$), and even homogeneous high self-control dyads (b = .93, exp(b) = 2.54, Wald χ^2 (1) = 4.04, $p = .04$). Finally, in line with my theory, there was not a significant difference in the self-control of intervention mixed dyads in which the high self-control person received the intervention and homogeneous low self-control dyads ($p = .26$) and no-intervention mixed dyads ($p = .09$).

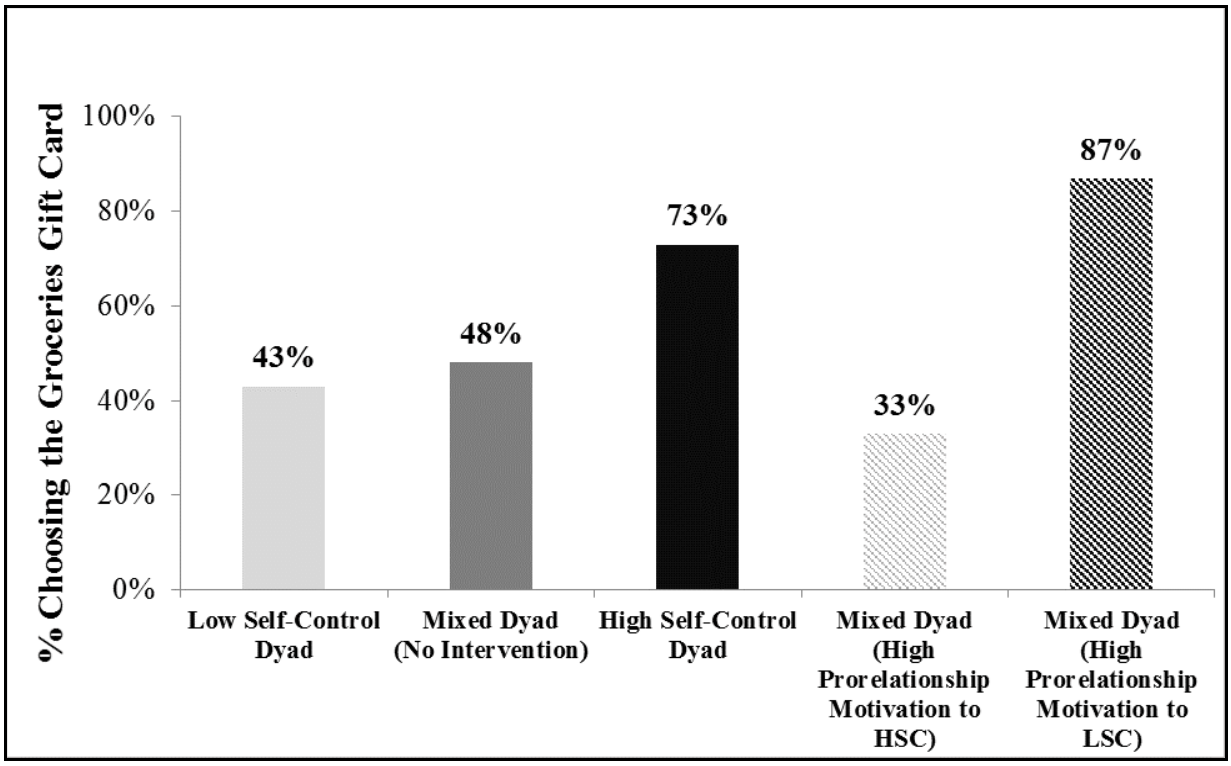


Figure 14. Gift Card Choice

4.9.3 Discussion

Study 4A replicated our previous findings using a consequential decision as a measure of participants' self-control in a joint decision. Most importantly, study 4A provided additional process evidence for our findings. In line with my theory, results showed that increasing the motivation of the low self-control partner in a mixed dyad to engage in prorelationship behaviors led to significantly higher self-control than both homogenous low self-control and no-intervention mixed pairs. In contrast, externally increasing the higher self-control partner's motivation to act in a prorelationship manner did not lead to a significant change in the indulgence of the joint decision. This suggests that even without intervention, higher self-control individuals already possess strong prorelationship motivation, consistent with our results of study

3 and theoretical account. However, I do note a marginal increase in indulgence in such cases. This implies that in situations in which prorelationship motivation is fostered, we may in fact see even more assent given to lower self-control partners' indulgent preferences. Finally, in addition to providing support for the prorelationship theoretical account, study 4A also highlighted one possible intervention that could be implemented on the low self-control partner in the mixed dyad to elevate joint self-control.

One limitation of study 4A was that it was conducted with virtual dyads where the virtual presence of one of the partners (i.e., their behavior in this situation) was modelled using their trait self-control. While taking trait self-control as a proxy for an individual decision tendency is supported by a large body of research, which demonstrates that low self-control individuals tend to lean toward indulgent options in most cases and high self-control individuals tend to exhibit better restraint in general (Baumeister et al. 1998; deRidder et al. 2012; Muraven and Baumeister 2000; Poynor and Haws 2009; Tangney et al. 2004), it is important to also provide process evidence using real, in-person dyads.

In study 4B I designed an intervention focused on decreasing one's motivation to behave in a prorelationship manner. I expect that decreasing the prorelationship motivation of the high self-control partner in a mixed dyad should encourage them to reduce their tendency to assent to the lower self-control partner's preferences, thus improving the joint self-control of mixed dyads. On the other hand, decreasing the prorelationship motivation of the low self-control partner should lead to self-control similar to that of no-intervention mixed dyads.

4.10 STUDY 4B

4.10.1 Method

Given that the pattern of results observed in homogeneous dyads has been reliably seen across all studies, Study 4B focused only on changing the joint decision behavior of mixed dyads. As such, I used a 3 group design: (no-intervention mixed dyads, mixed dyads with high self-control partner receiving the low prorelationship motivation intervention; and mixed dyads with low self-control partner receiving the low prorelationship intervention). I note that I did not give the low prorelationship motivation intervention to both partners in the mixed dyad simultaneously because I did not expect that this would lead any different joint self-control than the one observed in no-intervention mixed dyads (i.e., externally reducing the prorelationship motivation of both partners would lead to the higher self-control partner still having higher prorelationship motivation that the low self-control partner) and as such would not have been useful in testing the prorelationship account.

Participants (n = 78, 44% males, M_{age} = 20.7 years) were students at the University of Pittsburgh recruited through a paid-subjects pool and paid $5 for their participation in the study. All participants were contacted approximately one week before the study and asked to complete online the Brief Self-Control Scale (Tangney et al. 2004) and a set of demographic questions. This allowed me to classify participants as either low or high self-control as in the previous studies before the study began. Thus, upon arrival in the lab, participants could be assigned to a partner who had trait self-control opposite to theirs to create mixed dyads. During the first task all mixed dyads were randomly assigned to one of three conditions: (1) dyads in which the high self-control partner read a low prorelationship intervention article, while the low self-control

partner read a neutral article (n = 15); (2) dyads in which the low self-control partner read the low prorelationship intervention article, while the high self-control partner read a neutral article (n = 12); (3) dyads in which both partners read the neutral article (n = 12).

The low prorelationship motivation article was patterned after Gershoff and Johar (2006) and used excerpts from several online articles. Here, prorelationship motivation was lowered by stressing the importance of becoming an independent person while in college and learning to stand one's ground. The article described how learning to say "no" is one of the most useful and important skills students can develop in college, especially when it comes to living a more productive and healthy life. Furthermore, it emphasized that if one wants to gain others' respect, it is better to displease them by always standing for and doing what one believes is right than to please them by agreeing to do what is wrong. By contrast, the neutral article talked about the importance of exploring the city while in college (as in Gershoff and Johar 2006). The article discussed the various place that students can visit and the numerous activities that they can do while being in college. The exact texts of the articles are available upon request.

Then during the second task all dyads were asked to make a joint self-control decision. Specifically, all dyads were told that one randomly selected pair would receive a $25 gift card to a restaurant in the area. Moreover, they were told that gift cards were available for several different restaurants, some of which offer mainly healthy, but not so tasty food options, while the others offer primarily delicious but more unhealthy options. The dyads were asked to indicate what type of a restaurant they would like to receive a gift card for if they were the selected winner on a seven-point scale, anchored by 1 = "Very unhealthy but very tasty restaurant" and 7 = "Very healthy but not so tasty restaurant." The dyads' restaurant selection was used as a

measure of their joint self-control. Finally, all dyads were paid for their participation and dismissed.

4.10.2 Analysis and results

4.10.2.1 Articles pretest

To ensure that the low prorelationship motivation article did, in fact, lower prorelationship motivations, I conducted a pretest with a separate group of participants (n = 64, 63% males, M_{age} = 20.3 years), who were randomly assigned to read one of the two articles used in study 4B and rate them on several dimensions (e.g., interesting, convincing, informative). Then as a separate task, participants were asked to imagine that they were making a joint decision and respond to a set of items designed to measure their motivation to engage in prorelationship behaviors (the same items as in study 3; α = .89). As anticipated, individuals who read the low prorelationship motivation article had lower motivation to engage in prorelationship behaviors (M = 5.41, SD = .81) than those who read the neutral article *(*M = 5.85, SD = .59), $F(1, 62) = 6.40$, p = .01.

4.10.2.2 Restaurant preferences

A one-way ANOVA predicting dyads' restaurant preferences revealed a significant main effect of the dyad type, $F(2, 36) = 3.51$, p = .04, as shown in figure 15. Importantly, mixed dyads in which the high self-control partner received the low prorelationship motivation intervention selected a healthier restaurant (M = 4.07, SD = 1.22) than both the no-intervention mixed dyads (M = 3.17, SD = 1.03), $F(1, 36) = 4.17$, p = .05, and mixed dyads in which the low self-control

partner received the low prorelationship motivation intervention (M = 3.00, SD = 1.13), $F(1, 36) = 5.86$, $p = .02$. There was no difference in the self-control of the latter two dyad types ($p = .72$).

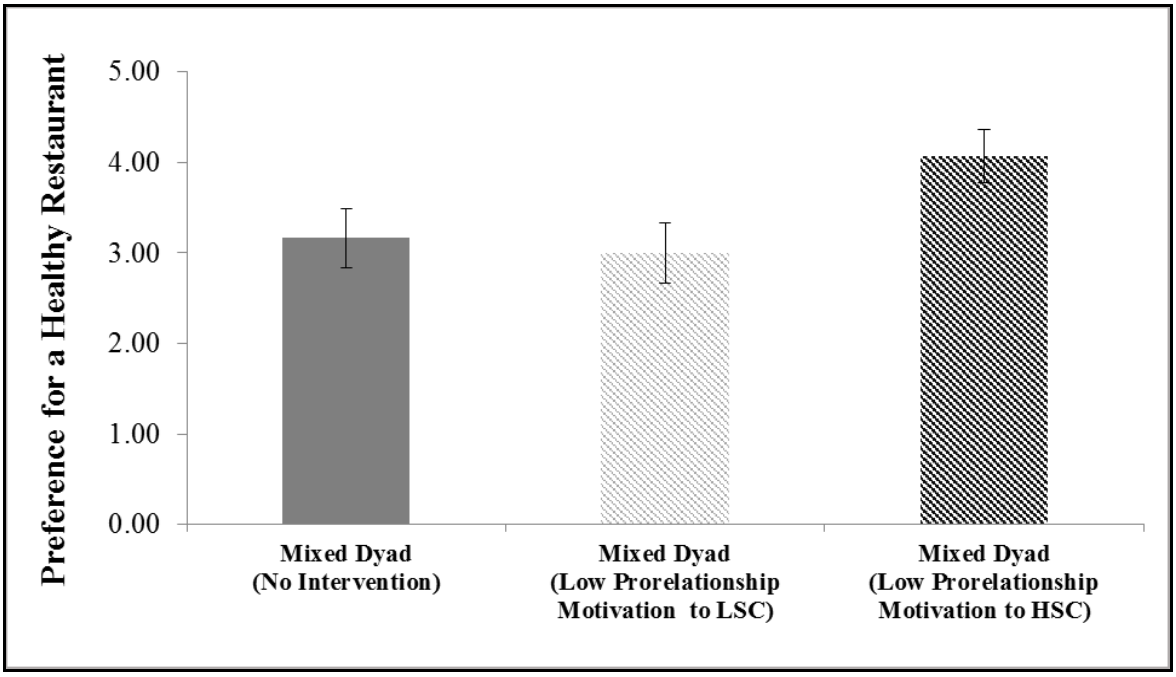


Figure 15. Restaurant Preferences

4.10.3 Discussion

Study 4B provided further evidence of the mechanism driving the indulgent choices of mixed pairs. Specifically, the findings showed that decreasing the motivation of the high self-control partners to act in a prorelationship manner led to more restraint in the dyad than in the no-intervention mixed dyads. However, decreasing the prorelationship motivation of the low self-control partners in mixed dyads did *not* make a difference, such that those dyads made as indulgent choices as the no-intervention mixed dyads. While the small sample size in this study is a concern, taken together studies 4A and 4B provide process evidence in support of the prorelationship account. Finally, I note that in the last two studies I used relatively strong

interventions to change individuals' prorelationship motivation and to establish the prorelationship account. Future research could examine whether the mixed dyads' joint self-control could be improved through more subtle interventions, i.e., "nudges," such as graphic communications or social norm cues. Identifying such interventions may be very useful for marketers (e.g., in marketing materials such as financial planning brochures or advertisements).

4.11 GENERAL DISCUSSION

Seven studies using real and hypothetical self-regulation behaviors, lab-created and virtual dyads, as well as actual married couples, all provided convergent patterns of results related to dyads' joint self-control decisions. Homogeneous high self-control dyads exhibited better self-control than both homogeneous low self-control and mixed self-control dyads. However, in all studies mixed dyads made choices consistent with poorer self-regulation than observed in homogeneous high self-control pairs and no better than that seen in homogeneous low self-control pairs. Furthermore, moderation study results suggest that when in a mixed dyad, the higher self-control individuals' motivation to act in a prorelationship manner leads them to assent to their lower self-control partner's indulgent preferences. Consistent with this mechanism, I demonstrate that increasing (decreasing) the prorelationship motivation of the lower (higher) self-control partner in a mixed dyad leads the mixed dyad to make less indulgent choices.

Thus, I can answer the question in my title: The safest route to success for higher self-control individuals is to partner with others of the same capacity, whether on short-term tasks or long-term life projects. However, higher self-control individuals should be wary of partnering

with low-self-control individuals. The likelihood is that their tendency to engage in prorelationship behaviors may negate their innate advantages in pursuing long-term goals. However, if lower self-control partners in such mixed pairs are externally motivated to act in prorelationship manners and compromise with their more assiduous partners, they can gain the advantages of being paired with someone who possesses a high degree of self-regulatory ability. Similarly, external interventions that decrease the higher self-control partners' prorelationship motivation by stressing the importance of standing one's ground can also be successfully applied to improve the joint self-control of mixed pairs.

This may come as a surprise to many consumers. A separate study (data available upon request) revealed that consumers have inaccurate intuitions about the self-control performance of the three different dyads. Specifically, the majority of participants in this study (80%) incorrectly believed that the self-regulation of mixed pairs will be better than that of homogeneous low self-control pairs. Furthermore, when asked about the types of behaviors that would occur in the interactions of mixed dyads, participants inaccurately predicted that the high self-control partner will persuade the low self-control partner to avoid short-term temptations and tenaciously pursue long-term goals, while the low self-control person will in turn give in to the beneficial influence of their high self-control partner. Such inaccurate intuitions might lead consumers to form suboptimal dyadic arrangements, which could be detrimental rather than beneficial (as consumers expect) to the well-being of both partners.

4.11.1 Theoretical contributions and practical implications

The present research makes a number of theoretical contributions. First, my work contributes to the self-control literature by examining the self-regulation patterns of dyads rather than

individuals in isolation. To the best of my knowledge, this is the first work that studies the joint self-control of pairs. Furthermore, my findings also suggest that the tendency for high self-control individuals to have better, more harmonious, more empathetic, and more cohesive interpersonal relationships (Tangney et al. 2004), as well as their higher likelihood to engage in prorelationship behaviors (Finkel and Campbell 2001; Pronk et al. 2010), may be a double-edged sword. Specifically, the tendency of higher self-control individuals in mixed dyads to assent rather than exert more persuasion or model good behavior could ultimately impair the dyad's joint self-regulation performance.

My research also builds directly on recent papers focusing on relationship quality and marital well-being (Rick et al. 2011; Vohs et al. 2011). Vohs al. (2011) suggested that relationship quality was better when partners' self-control sums were highest. My work takes a slightly different approach and focuses on different outcomes, parsing this "sum" into individuals' distinct contribution to the dyad's self-regulation decisions. Perhaps because my focal outcomes are different, the sum model does not consistently predict my results. However, it is reasonable that relationship quality might be related to joint regulatory decisions. Thus, future research may explore the components that make the determinants of marital happiness differ from those directly related to self-regulatory decisions. In a related vein, Rick et al. (2011) demonstrate that a tendency toward mixed tightwad/spendthrift (i.e. chronic over- or under-spending) combinations in marriage leads to conflict and marital unhappiness. The present research differs from and at the same time builds on the findings of Rick et al. (2011) in two important ways. First, I use trait self-control, which is a distinct individual difference variable from the tightwad/spendthrift tendency (Rick, Cryder, and Loewenstein 2008), to classify the dyads. Second, I generalize their investigation beyond marriage-related outcomes and

demonstrate that such mixed pairs are also suboptimal for the joint self-control of dyads and their pursuit of long-term goals. Moreover, unlike both Rick et al. (2011) and Vohs et al. (2011), I demonstrate our outcomes with even arbitrary pairings, which increases the practical relevance of my theoretical insights.

This research also offers a variety of promising practical implications, which could improve consumers' well-being in different aspects of their lives. For instance, many individuals who struggle with self-control place themselves in groups or "accountability pairs" in an effort to improve their behaviors. Similarly, commercial programs designed to help consumers overcome various self-control problems also often rely on "accountability pairs": Weight Watchers encourages individuals to sign up in a "buddy system," and Alcoholics Anonymous pairs recovering individuals with those who have already completed treatment. However, my work suggests that such "social solutions" for self-control problems might in some cases lead to suboptimal results unless they include external interventions for the sub-optimally constructed mixed dyads, such as reminders to the low self-control partners in these pairs to focus on harmony and the success of the relationship or the high self-control partner to stand their ground.

Furthermore, in a variety of occupations, people are encouraged to work in pairs to maximize their performance outcomes. For example, a popular software development practice called "pair programming" requires two programmers to work together with the intention to produce better programs with fewer bugs. My findings suggest that such arrangements might not be effective in cases in which the partners' self-control levels are combined in a suboptimal fashion (i.e., could lead to more procrastination in the case of programming pairs of mixed self-control levels) and highlight external interventions that could be used to improve performance.

In addition, my findings have implications for the well-being and joint self-control of married couples who often make joint decisions regarding the family spending, savings, and food choices. Understanding how the combination of two spouses' self-control levels affects the joint decision-making should help couples make better decisions with regards to their spending, saving, and eating, and thus improve their overall well-being and marriage quality. For instance, about 80% of divorced couples point to financial problems as the primary cause for their divorces (Carr 2003). Common wisdom also suggests the financial struggles that couples encounter are often the acid test for the stability and quality of their relationships. Given that such financial issues often occur because of the couples' inability to exercise self-control, overcoming joint financial self-control challenges successfully could reduce the financial problems that couples encounter, helping improve marriage longevity and well-being.

This work also offers interesting practical implications for marketers. For example, financial planners who assist married couples with their retirement decisions should also be aware of these findings. Taking into consideration the spouse's trait self-control levels should be helpful to financial planners as they decide how to best help couples make wise retirement decisions. For example, in the case of a mixed couple, it might be better to cede control over the retirement decisions to the higher self-control partner instead of encouraging joint decision-making. Furthermore, my findings also highlight that marketers should be careful with using "bring-a-friend" marketing campaigns especially for products targeting consumers' self-control problems, such as gym subscriptions. For instance, if a high self-control individual decides to bring a low self-control friend and starts working jointly with them, this might ultimately lead to failure to achieve the desired fitness goals and cancellation of the subscription.

4.11.2 Limitations and future research

Finally, I note that this research is not without limitations. First, though I obtain results consistent with our predicted pattern in all studies, the small cell sizes in studies 1A and 4A are a concern. As the smallest cell in study 1A was the homogeneous high self-control cell, in which responses offer perhaps the least novel finding, and as the results replicate across contexts and decision types, I hope that these results converge to form a convincing picture. However, with access to a greater number of dyads, a larger-scale replication would be valuable, and might allow exploration of additional moderators that our analysis lacks the power to identify.

Further, I note in all of our studies we classified participants as low or high self-control depending on whether their trait self-control was below or above the mean to identify the dyads/couples as one of the three types. This was necessary to create the independent variable – dyad type (homogeneous low, mixed, or high self-control), which was the focus of my research. It might be argued that a different handling of data would have been more appropriate, such as summing partner's self-control scores and using this variable to predict the dyad's joint self-control. However, this would have imposed an additive relationship between the trait self-control of the two partners and I did not feel that we can confidently make this assumption. In addition, it might be proposed that I treat the partners' trait self-control levels as continuous variables, using these two measures to conduct a regression model in which the dyad's self-control is predicted by both partners' self-control and their interaction. The interaction term in the above-described analysis would tell us whether the effect of one partner's self-control on the dyad's joint self-control is dependent on the other partner's self-control. While interesting, this is a different question than the one explored in the present work, where I take the dyad as the unit of

analysis. Future work may adopt such an interactive approach, and may shed additional light on social influence effects in self-control.

Another option would be to consider classifying individuals in a dyad based on their relative self-control within the dyad – the higher partner would be Partner 1 and the lower partner Partner 2. This would take us away from the research question, as it would lead to a design only composed of mixed dyads (it is highly unlikely that two partners would have exactly equal self-control). Further, a partner that might be "lower" in one dyad (for example, if two people had self-control scores of 7 and 6.5) might actually be "high" in the data as a whole, where the mean might be 4.

A fourth option would be to use the Actor-Partner Interdependence Model (APIM), which has been increasingly used in the social sciences (e.g., Simpson, Griskevicius, and Rothman 2012). While this might have appeal, I note that it is not appropriate for my case. In the APIM, the dyad is the highest unit of analysis and the individual members are nested within the dyad. Using the APIM, one could estimate the effect of a dyad member's independent variable on his own outcome variable (known as an actor effect), as well as on his partner's outcome variable (known as a partner effect; Kenny and Cook 1999). Thus, the APIM is only appropriate for analyzing dyadic data in situations when both dyad members respond to the dependent variable individually, with the model accounting for the non-independence between the two observations due to the dyadic relationship. However, Kenny and Cook (1999) note that the APIM cannot be estimated for outcome variables that are measured at the couple level, as is the case with couple's joint self-control in our work. That is, the APIM is the appropriate analytical tool for the so called "single decisions, joint consumption" situations in Gorlin and Dhar's joint decisions typology (2012), as opposed to our "joint decisions, joint consumption" context. Thus,

using the mean trait self-control scores for the sake of classification was both methodologically and conceptually our most appropriate option. Future work may explore means of combining dyadic, or even group, self-control levels, in ways that preserve the theoretical meaningfulness of each individual's contribution while also being statistically appropriate for joint decisions.

I also focused only on comparing the self-control of dyads to other dyads. It would be interesting to examine the self-control of the three different dyad types to that of individual decision makers. For instance, it could be argued that the homogeneous low self-control pairs will exhibit better (worse) self-control than one low self-control individual due to accountability (social contagion). Moreover, though in this research I focused only on conjunctive joint tasks and decisions, future research could also explore how different combinations of partners' trait self-control impact performance on other dyadic tasks, such as additive, compensatory, disjunctive, and complementary tasks (Steiner 1966).

Furthermore, married couples often differ in the extent to which they make mutual decisions. Some couples discuss and make *all* decisions together as a team, while others prefer to separate their responsibilities with each spouse taking individual decisions in their areas of expertise (e.g., the wife manages the household eating decisions, while the husbands takes care of the finances). Understanding why some couples engage in more collaborative decision-making than others, as well as under what circumstances each relationship model (joint decision-making or ceding control of certain decisions in one of the spouses) will be more effective for the couple's long-term well-being could yield important insights.

Finally, studying the dynamics of self-control in larger groups than dyads is also a promising future research direction. Given the prevalence and importance of support groups for helping consumers overcome many self-control related problems (e.g., smoking cessation

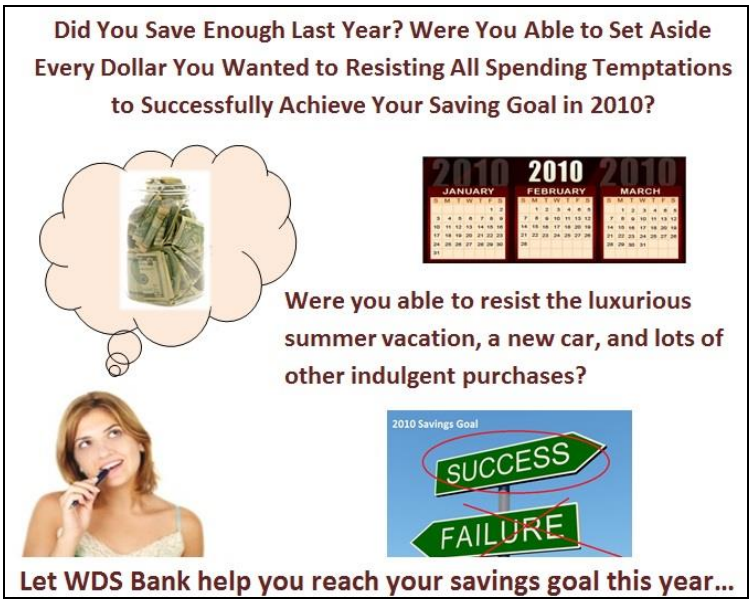
support groups, weight loss and dieting groups), it would be interesting to study the processes through which such groups are successful in facilitating consumers' self-control.

APPENDIX A

ADVERTISING STIMULI AND PRETEST (ESSAY 1, STUDY 2B)

A.1 AD DESIGNED TO CUE RECALL OF PAST SELF-CONTROL FAILURES

A.2 AD DESIGNED TO CUE RECALL OF PAST SELF-CONTROL SUCCESSES



A.3 PRETEST RESULTS

Measures:

1. Do you think this ad is likely to make people recall ways in which they:
Failed at meeting savings goals in the past (1) ----- Succeeded at meeting savings goals in the past (7)
2. Does the person in the ad look as though they:
Saved only a little bit of money last year (1) ----- Saved a lot of money last year (7)
3. If you saw this ad, would it make you think about how much you might have succeeded at saving a substantial amount of money in the past?
Not at all (1) ----- Very much (7)
4. If you saw this ad, would it make you think about how you might have found saving large portions of money easy?
Not at all (1) ----- Very much (7)
5. Please indicate your evaluation of the ad using the below scale:
Not appealing (1) ----- Very appealing (7)
Not at all exciting (1) ----- Very exciting (7)
Believable (1) ----- Unbelievable (7)
Informative (1) ----- Uninformative (7)
6. The message in the ad: (ad persuasiveness index, $\alpha = .87$)
Is not persuasive (1) ----- Is persuasive (7)

Provides weak arguments (1) ----- Provides strong arguments (7)
Is not compelling (1) ----- Is compelling (7)

7. Indicate the extent to which you are interested in the products offered in the ad:

Not interested at all (1) ----- Very interested (7)

Results:

Variable	$M_{successes\ ad}$ (SD)	$M_{failures\ ad}$ (SD)	*p*-value
Manipulation Checks			
Recall successes at meeting past savings goals	2.92 (1.89)	1.87 (1.31)	$p < .0001$
Person in ad looks as if they saved a lot last year	4.10 (1.93)	2.02 (1.50)	$p < .0001$
Ad makes you think about successes at saving	3.37 (1.52)	2.71 (1.44)	$p = .003$
Ad makes you think that saving a lot is easy	3.22 (1.47)	2.55 (1.28)	$p = .001$
Confound Checks			
Ad appealing	3.06 (1.53)	2.86 (1.49)	$p = .38$
Ad exciting	2.92 (1.42)	2.59 (1.20)	$p = .09$
Ad unbelievable	3.96 (1.47)	3.76 (1.50)	$p = .28$
Ad uninformative	4.48 (1.55)	4.43 (1.76)	$p = .84$
Ad message persuasiveness	3.66 (1.34)	3.39 (1.47)	$p = .20$
Interest in products in ad	2.78 (1.63)	2.51 (1.54)	$p = .26$

APPENDIX B

SOCIAL IDENTITY THREAT MANIPULATION: BUSINESS STUDENTS (ESSAY 2)

Imagine that you are having a conversation with a friend of yours at the school cafeteria. While talking about your schoolwork, your friend mentions a recent article he/she read in the newspaper. The article discussed how business students tend to perform worse academically than students from other majors. Your friend shows you the article and here are the abstracts that he/she was intrigued by and highlighted. Please read these abstracts of the article very carefully because you will be asked questions about them later.

"A.D, a business professor at B. University, does not give his business students the same exams he gave 10 or 15 years ago. "Not many of them would pass," he says."

"…all evidence suggests that student disengagement is at its worst in undergraduate business education."

"In their new book "Academically Adrift: Limited Learning on College Campuses," the sociologists Richard Arum and Josipa Roksa report that business majors had the weakest gains during the first two years of college on a national test of writing and reasoning skills."

"Recent statistics disclosed by the Admissions Office at the [participants' university] show that the SAT scores for business students are significantly lower than those of engineering students. In 2011, the average SAT score for students admitted to the School of Business was 2100, while the average SAT score of freshmen at the Engineering School was 2305."

"Finally, the acceptance rate of business students at graduate schools is significantly lower than the acceptance rate of engineering students."

APPENDIX C

PRETESTS AND MANIPULATION CHECKS

C.1 PRETEST FOR COPING STRATEGY MANIPULATIONS

Thirty-seven participants (36% female) read the social identity threat scenario and implemented one of the two coping strategies as in Experiment 1. Following the threat and coping manipulations, participants responded to prompt assessing (a) the effectiveness of the sentence completion task at manipulating the target concept and (b) whether the two strategies were equally motivating and enjoyable.

Coping Strategy	Superior Self Manipulation Check ($\alpha = .91$)	Inferior Others Manipulation Check ($\alpha = .95$)	Motivation	Enjoyment
Superior Self	5.30_a	1.63_b	3.40	3.06
Inferior Others	2.17_a	5.00_b	2.95	2.73

Note: Items with same subscripts are significantly different from each other at the $p < .0001$ level. The Superior Self Manipulation Check was measured with two items ("In order to fill out the sentences, I came up with a number of positive traits that describe me as a person.", "I completed the sentences primarily with positive traits and characteristics of myself.") and the Inferior Others Manipulation Check was measured with two items ("In order to fill out the sentences, I came up with a number of different groups of people which I do not belong to.", "I completed the sentences primarily with groups of people which I do not belong to") measured on 1 to 7 scales. The Motivation and Enjoyment items were single-item measures.

C.2 PRETEST FOR THE ACCESSIBILITY MANIPULATION (STUDY 4C)

Eighty-one participants (% female) were given the same pronoun counting task as in Experiment 5B. Then respondents were presented with 10 sentences written in Bulgarian, with one underlined word in them. Participants were asked to guess whether the underlined word referred to a first-person pronoun ("I", "me", "mine") or a third-people pronoun ("they", "them", "theirs"). Finally, participants indicated their agreement with the following two items, which served as additional manipulation checks: "While reading the paragraph, I thought primarily about myself" and "The paragraph made me focus on other people" (a 7-point scale anchored by 1, "Strongly Disagree", and 7, "Strongly Agree").

Accessibility Condition	First-Person Pronouns	Third-Person Pronouns	Thought about Self	Thought about Others
Self-Accessibility	4.57_a	5.43_b	3.43_c	3.80_d
Other-Accessibility	4.10_a	5.90_b	2.68_c	4.71_d

Note: Items with same subscripts are significantly different from each other at the $p < .05$ level.

APPENDIX D

ADVERTISING STIMULI (ESSAY 2, STUDY 3)

D.1 FOCUS ON SUPERIOR SELF-ASPECTS AD

D.2 FOCUS ON INFERIOR OTHERS AD

People say football fans are more obnoxious, loud, and annoying than baseball fans...

But c'mon! We know there are plenty of fans that are more crude than you...

Just think of a few of those...

1. ...
2. ...
3. ...

Plus, it's your life: be who you want to be.
And that's why more fans go with Visa:
make it epic.

VISA | NFL

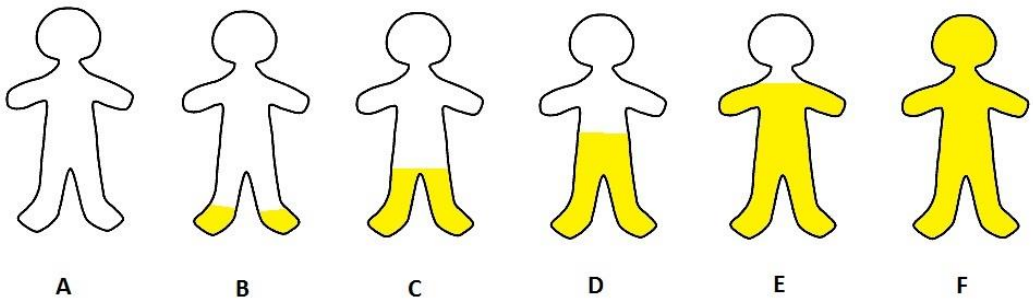
APPENDIX E

ACTIVATION OF SELF (VISUAL MEASURE; ESSAY 2, STUDY 4A)

We are interested in how much you thought about yourself, the person you are, as well as the traits and abilities that describe yourself, while you were imagining the scenario at the beginning of the survey.

When we think about ourselves, who we are, what we like to do, and how we describe ourselves, we might only scratch the surface of our self-knowledge, or we might think extensively about the many aspects of our personality. The figures below are meant to represent how much information about yourself you accessed during the scenario on the previous page. The empty figure indicates that "no self-knowledge is vivid in your mind" while the completely filled-in figure signifies that "all of my self-knowledge is vivid in my mind".

Please choose the figure that best describes how much self-knowledge is active in your mind right now.



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